SEQUENCE LISTING

<110> Han, et al.

<120> HUMAN E3 ALPHA UBIQUITIN LIGASE FAMILY

<130> 01017/35966B

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<212> DNA
<213> Homo sapiens

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tcgtaaaagt gtcgtccctg tctctccgac cggccacagg tttccgcttg cctctggccg   660

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Gly Gly Thr Glu Arg Met Glu Ile Ser Ala Glu Leu Pro Gln Thr Pro
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cag cgt ctg gca tct tgg tgg gat cag caa gtt gat ttt tat act gct          809
Gln Arg Leu Ala Ser Trp Trp Asp Gln Gln Val Asp Phe Tyr Thr Ala
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ttc ttg cat cat ttg gca caa ttg gtg cca gaa att tac ttt gct gaa          857
Phe Leu His His Leu Ala Gln Leu Val Pro Glu Ile Tyr Phe Ala Glu
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atg gac cca gac ttg gaa aag cag gag gaa agt gta caa atg tca ata          905
Met Asp Pro Asp Leu Glu Lys Gln Glu Glu Ser Val Gln Met Ser Ile
55                  60                  65                  70

ttc act cca ctg gaa tgg tac tta ttt gga gaa gat cca gat att tgc          953
Phe Thr Pro Leu Glu Trp Tyr Leu Phe Gly Glu Asp Pro Asp Ile Cys
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tta gag aaa ttg aag cac agt gga gca ttt cag ctt tgt ggg agg gtt          1001
Leu Glu Lys Leu Lys His Ser Gly Ala Phe Gln Leu Cys Gly Arg Val
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ttc aaa agt gga gag aca acc tat tct tgc agg gat tgt gca att gat          1049
Phe Lys Ser Gly Glu Thr Thr Tyr Ser Cys Arg Asp Cys Ala Ile Asp
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cca aca tgt gta ctc tgt atg gac tgc ttc cag gac agt gtt cat aaa          1097
Pro Thr Cys Val Leu Cys Met Asp Cys Phe Gln Asp Ser Val His Lys
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aat cat cgt tac aag atg cat act tct act gga gga ggg ttc tgt gac          1145
Asn His Arg Tyr Lys Met His Thr Ser Thr Gly Gly Gly Phe Cys Asp
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tgt gga gac aca gag gca tgg aaa act ggc cct ttt tgt gta aat cat          1193
Cys Gly Asp Thr Glu Ala Trp Lys Thr Gly Pro Phe Cys Val Asn His
                155                 160                 165

gaa cct gga aga gca ggt act ata aaa gag aat tca cgc tgt ccg ttg          1241
Glu Pro Gly Arg Ala Gly Thr Ile Lys Glu Asn Ser Arg Cys Pro Leu
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aat gaa gag gta att gtc caa gcc agg aaa ata ttt cct tca gtg ata          1289
Asn Glu Glu Val Ile Val Gln Ala Arg Lys Ile Phe Pro Ser Val Ile
        185                 190                 195

aaa tat gtc gta gaa atg act ata tgg gaa gag gaa aaa gaa ctg cct          1337
Lys Tyr Val Val Glu Met Thr Ile Trp Glu Glu Glu Lys Glu Leu Pro
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cct gaa ctc cag ata agg gag aaa aat gaa aga tac tat tgt gtc ctt          1385
Pro Glu Leu Gln Ile Arg Glu Lys Asn Glu Arg Tyr Tyr Cys Val Leu
215                 220                 225                 230

ttc aat gat gaa cac cat tca tat gac cac gtc ata tac agc cta caa          1433
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aga gct ctt gac tgt gag ctc gca gag gcc cag ttg cat acc act gcc          1481
Arg Ala Leu Asp Cys Glu Leu Ala Glu Ala Gln Leu His Thr Thr Ala
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caa cat cca ctt cat gta gaa gta tta cac tca gag att atg gct cat      1625
Gln His Pro Leu His Val Glu Val Leu His Ser Glu Ile Met Ala His
295             300             305             310

cag aaa ttt gct ttg cgt ctt ggt tcc tgg atg aac aaa att atg agc      1673
Gln Lys Phe Ala Leu Arg Leu Gly Ser Trp Met Asn Lys Ile Met Ser
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tat tca agt gac ttt agg cag atc ttt tgc caa gca tgc ctt aga gaa      1721
Tyr Ser Ser Asp Phe Arg Gln Ile Phe Cys Gln Ala Cys Leu Arg Glu
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gaa cct gac tcg gag aat ccc tgt ctc ata agc agg tta atg ctt tgg      1769
Glu Pro Asp Ser Glu Asn Pro Cys Leu Ile Ser Arg Leu Met Leu Trp
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gat gca aag ctt tat aaa ggt gcc cgt aag atc ctt cat gaa ttg atc      1817
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ttc agc agt ttt ttt atg gag atg gaa tac aaa aaa ctc ttt gct atg      1865
Phe Ser Ser Phe Phe Met Glu Met Glu Tyr Lys Lys Leu Phe Ala Met
375             380             385             390

gaa ttt gtg aag tat tat aaa caa ctg cag aaa gaa tat atc agt gat      1913
Glu Phe Val Lys Tyr Tyr Lys Gln Leu Gln Lys Glu Tyr Ile Ser Asp
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gat cat gac aga agt atc tct ata act gca ctt tca gtt cag atg ttt      1961
Asp His Asp Arg Ser Ile Ser Ile Thr Ala Leu Ser Val Gln Met Phe
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act gtt cct act ctg gct cga cat ctt att gaa gag cag aat gtt atc      2009
Thr Val Pro Thr Leu Ala Arg His Leu Ile Glu Glu Gln Asn Val Ile
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tct gtc att act gaa act ctg cta gaa gtt tta cct gag tac ttg gac      2057
Ser Val Ile Thr Glu Thr Leu Leu Glu Val Leu Pro Glu Tyr Leu Asp
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agg aac aat aaa ttc aac ttc cag ggt tat agc cag gac aaa ttg gga      2105
Arg Asn Asn Lys Phe Asn Phe Gln Gly Tyr Ser Gln Asp Lys Leu Gly
455             460             465             470

aga gta tat gca gta ata tgt gac cta aag tat atc ctg atc agc aaa      2153
Arg Val Tyr Ala Val Ile Cys Asp Leu Lys Tyr Ile Leu Ile Ser Lys
            475             480             485

ccc aca ata tgg aca gaa aga tta aga atg cag ttc ctt gaa ggt ttt      2201
Pro Thr Ile Trp Thr Glu Arg Leu Arg Met Gln Phe Leu Glu Gly Phe
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cga tct ttt ttg aag att ctt acc tgt atg cag gga atg gaa gaa atc      2249
Arg Ser Phe Leu Lys Ile Leu Thr Cys Met Gln Gly Met Glu Glu Ile
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cga aga cag gtt ggg caa cac att gaa gtg gat cct gat tgg gag gct      2297
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gcc att gct ata cag atg caa ttg aag aat att tta ctc atg ttc caa      2345
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535             540             545             550

gag tgg tgt gct tgt gat gaa gaa ctc tta ctt gtg gct tat aaa gaa      2393
Glu Trp Cys Ala Cys Asp Glu Glu Leu Leu Leu Val Ala Tyr Lys Glu
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tgt cac aaa gct gtg atg agg tgc agt acc agt ttc ata tct agt agc      2441
Cys His Lys Ala Val Met Arg Cys Ser Thr Ser Phe Ile Ser Ser Ser
            570             575             580

aag aca gta gta caa tcg tgt gga cat agt ttg gaa aca aag tcc tac      2489
Lys Thr Val Val Gln Ser Cys Gly His Ser Leu Glu Thr Lys Ser Tyr
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aga gta tct gag gat ctt gta agc ata cat ctg cca ctc tct agg acc      2537
Arg Val Ser Glu Asp Leu Val Ser Ile His Leu Pro Leu Ser Arg Thr
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ctt gct ggt ctt cat gta cgt tta agc agg ctg ggt gct gtt tca aga      2585
Leu Ala Gly Leu His Val Arg Leu Ser Arg Leu Gly Ala Val Ser Arg
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Leu His Glu Phe Val Ser Phe Glu Asp Phe Gln Val Glu Val Leu Val
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gaa tat cct tta cgt tgt ctg gtg ttg gtt gcc cag gtt gtt gct gag      2681
Glu Tyr Pro Leu Arg Cys Leu Val Leu Val Ala Gln Val Val Ala Glu
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Met Trp Arg Arg Asn Gly Leu Ser Leu Ile Ser Gln Val Phe Tyr Tyr
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caa gat gtt aag tgc aga gaa gaa atg tat gat aaa gat atc atc atg      2777
Gln Asp Val Lys Cys Arg Glu Glu Met Tyr Asp Lys Asp Ile Ile Met
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ctt cag att ggt gca tct tta atg gat ccc aat aag ttc ttg tta ctg      2825
Leu Gln Ile Gly Ala Ser Leu Met Asp Pro Asn Lys Phe Leu Leu Leu
695             700             705             710

gta ctt cag agg tat gaa ctt gcc gag gct ttt aac aag acc ata tct      2873
Val Leu Gln Arg Tyr Glu Leu Ala Glu Ala Phe Asn Lys Thr Ile Ser
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aca aaa gac cag gat ttg att aaa caa tat aat aca cta ata gaa gaa      2921
Thr Lys Asp Gln Asp Leu Ile Lys Gln Tyr Asn Thr Leu Ile Glu Glu
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atg ctt cag gtc ctc atc tat att gtg ggt gag cgt tat gta cct gga      2969
Met Leu Gln Val Leu Ile Tyr Ile Val Gly Glu Arg Tyr Val Pro Gly
            745             750             755

gtg gga aat gtg acc aaa gaa gag gtc aca atg aga gaa atc att cac      3017
Val Gly Asn Val Thr Lys Glu Glu Val Thr Met Arg Glu Ile Ile His
            760             765             770

ttg ctt tgc att gaa ccc atg cca cac agt gcc att gcc aaa aat tta      3065
Leu Leu Cys Ile Glu Pro Met Pro His Ser Ala Ile Ala Lys Asn Leu
775             780             785             790
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gtg gcc aca ttt aag aaa cca ggt gta tca ggc cat gga gtt tat gaa        3161
Val Ala Thr Phe Lys Lys Pro Gly Val Ser Gly His Gly Val Tyr Glu
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cta aaa gat gaa tca ctg aaa gac ttc aat atg tac ttt tat cat tac        3209
Leu Lys Asp Glu Ser Leu Lys Asp Phe Asn Met Tyr Phe Tyr His Tyr
            825                 830                 835

tcc aaa acc cag cat agc aag gct gaa cat atg cag aag aaa agg aga        3257
Ser Lys Thr Gln His Ser Lys Ala Glu His Met Gln Lys Lys Arg Arg
            840                 845                 850

aaa caa gaa aac aaa gat gaa gca ttg ccg cca cca cca cct cct gaa        3305
Lys Gln Glu Asn Lys Asp Glu Ala Leu Pro Pro Pro Pro Pro Glu
855                 860                 865                 870

ttc tgc cct gct ttc agc aaa gtg att aac ctt ctc aac tgt gat atc        3353
Phe Cys Pro Ala Phe Ser Lys Val Ile Asn Leu Leu Asn Cys Asp Ile
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atg atg tac att ctc agg acc gta ttt gag cgg gca ata gac aca gat        3401
Met Met Tyr Ile Leu Arg Thr Val Phe Glu Arg Ala Ile Asp Thr Asp
            890                 895                 900

tct aac ttg tgg acc gaa ggg atg ctc caa atg gct ttt cat att ctg        3449
Ser Asn Leu Trp Thr Glu Gly Met Leu Gln Met Ala Phe His Ile Leu
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gca ttg ggt tta cta gaa gag aag caa cag ctt caa aaa gct cct gaa        3497
Ala Leu Gly Leu Leu Glu Glu Lys Gln Gln Leu Gln Lys Ala Pro Glu
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gaa gaa gta aca ttt gac ttt tat cat aag gct tca aga ttg gga agt        3545
Glu Glu Val Thr Phe Asp Phe Tyr His Lys Ala Ser Arg Leu Gly Ser
935                 940                 945                 950

tca gcc atg aat ata caa atg ctt ttg gaa aaa ctc aaa gga att ccc        3593
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cag tta gaa ggc cag aag gac atg ata acg tgg ata ctt cag atg ttt        3641
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Asp Thr Val Lys Arg Leu Arg Glu Lys Ser Cys Leu Ile Val Ala Thr
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Thr Ser Gly Ser Glu Ser Ile Lys Asn Asp Glu Ile Thr His Asp
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aaa gaa aaa gca gaa cga aaa aga aaa gct gaa gct gct agg cta          3779
Lys Glu Lys Ala Glu Arg Lys Arg Lys Ala Glu Ala Ala Arg Leu
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cat cgc cag aag atc atg gct cag atg tct gcc tta cag aaa aac          3824
His Arg Gln Lys Ile Met Ala Gln Met Ser Ala Leu Gln Lys Asn
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cct ggg aaa gaa gat tcc att   atg gag gaa gag agc   acc cca gca       3914
Pro Gly Lys Glu Asp Ser Ile   Met Glu Glu Glu Ser   Thr Pro Ala
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gtc agt gac tac tct aga att   gct ttg ggt cct aaa   cgg ggt cca       3959
Val Ser Asp Tyr Ser Arg Ile   Ala Leu Gly Pro Lys   Arg Gly Pro
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tct gtt act gaa aag gag gtg   ctg acg tgc atc ctt   tgc caa gaa       4004
Ser Val Thr Glu Lys Glu Val   Leu Thr Cys Ile Leu   Cys Gln Glu
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gaa cag gag gtg aaa ata gaa   aat aat gcc atg gta   tta tcg gcc       4049
Glu Gln Glu Val Lys Ile Glu   Asn Asn Ala Met Val   Leu Ser Ala
    1105            1110                   1115

tgt gtc cag aaa tct act gcc   tta acc cag cac agg   gga aaa ccc       4094
Cys Val Gln Lys Ser Thr Ala   Leu Thr Gln His Arg   Gly Lys Pro
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ata gaa ctc tca gga gaa gcc   cta gac cca ctt ttc   atg gat cca       4139
Ile Glu Leu Ser Gly Glu Ala   Leu Asp Pro Leu Phe   Met Asp Pro
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gac ttg gca tat gga act tat   aca gga agc tgt ggt   cat gta atg       4184
Asp Leu Ala Tyr Gly Thr Tyr   Thr Gly Ser Cys Gly   His Val Met
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cac gca gtg tgc tgg cag aag   tat ttt gaa gct gta   cag ctg agc       4229
His Ala Val Cys Trp Gln Lys   Tyr Phe Glu Ala Val   Gln Leu Ser
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tct cag cag cgc att cat gtt   gac ctt ttt gac ttg   gaa agt gga       4274
Ser Gln Gln Arg Ile His Val   Asp Leu Phe Asp Leu   Glu Ser Gly
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gaa tat ctt tgc cct ctt tgc   aaa tct ctg tgc aat   act gtg atc       4319
Glu Tyr Leu Cys Pro Leu Cys   Lys Ser Leu Cys Asn   Thr Val Ile
    1195            1200                   1205

ccc att att cct ttg caa cct   caa aag ata aac agt   gag aat gca       4364
Pro Ile Ile Pro Leu Gln Pro   Gln Lys Ile Asn Ser   Glu Asn Ala
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Asp Ala Leu Ala Gln Leu Leu   Thr Leu Ala Arg Trp   Ile Gln Thr
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Val Leu Ala Arg Ile Ser Gly   Tyr Asn Ile Arg His   Ala Lys Gly
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gaa aac cca att cct att ttc   ttt aat caa gga atg   gga gat tct       4499
Glu Asn Pro Ile Pro Ile Phe   Phe Asn Gln Gly Met   Gly Asp Ser
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act ttg gag ttc cat tcc atc   ctg agt ttt ggc gtt   gag tct tcg       4544
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Thr Thr  Ile Tyr Arg Ile Gly  Leu Lys Val Pro Pro  Asp Glu Arg
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Asp Pro  Arg Val Pro Met Leu  Thr Trp Ser Thr Cys  Ala Phe Thr
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atc cag  gca att gaa aat cta  ttg gga gat gaa gga  aaa cct ctg       4724
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ttt gga  gca ctt caa aat agg  cag cat aat ggt ctg  aaa gca tta       4769
Phe Gly  Ala Leu Gln Asn Arg  Gln His Asn Gly Leu  Lys Ala Leu
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atg cag  ttt gca gtt gca cag  agg att acc tgt cct  cag gtc ctg       4814
Met Gln  Phe Ala Val Ala Gln  Arg Ile Thr Cys Pro  Gln Val Leu
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ata cag  aaa cat ctg gtt cgt  ctt cta tca gtt gtt  ctt cct aac       4859
Ile Gln  Lys His Leu Val Arg  Leu Leu Ser Val Val  Leu Pro Asn
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ata aaa  tca gaa gat aca cca  tgc ctt ctg tct ata  gat ctg ttt       4904
Ile Lys  Ser Glu Asp Thr Pro  Cys Leu Leu Ser Ile  Asp Leu Phe
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cat gtt  ttg gtg ggt gct gtg  tta gca ttc cca tcc  ttg tat tgg       4949
His Val  Leu Val Gly Ala Val  Leu Ala Phe Pro Ser  Leu Tyr Trp
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gat gac  cct gtt gat ctg cag  cct tct tca gtt agt  tct tcc tat       4994
Asp Asp  Pro Val Asp Leu Gln  Pro Ser Ser Val Ser  Ser Ser Tyr
    1420              1425              1430

aac cac  ctt tat ctc ttc cat  ttg atc acc atg gca  cac atg ctt       5039
Asn His  Leu Tyr Leu Phe His  Leu Ile Thr Met Ala  His Met Leu
    1435              1440              1445

cag ata  cta ctt aca gta gac  aca ggc cta ccc ctt  gct cag gtt       5084
Gln Ile  Leu Leu Thr Val Asp  Thr Gly Leu Pro Leu  Ala Gln Val
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caa gaa  gac agt gaa gag gct  cat tcc gca tct tct  ttc ttt gca       5129
Gln Glu  Asp Ser Glu Glu Ala  His Ser Ala Ser Ser  Phe Phe Ala
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gaa att  tct caa tat aca agt  ggc tcc att ggg tgt  gat att cct       5174
Glu Ile  Ser Gln Tyr Thr Ser  Gly Ser Ile Gly Cys  Asp Ile Pro
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ggc tgg  tat ttg tgg gtc tca  ctg aag aat ggc atc  acc cct tat       5219
Gly Trp  Tyr Leu Trp Val Ser  Leu Lys Asn Gly Ile  Thr Pro Tyr
    1495              1500              1505

ctt cgc  tgt gct gca ttg ttt  ttc cac tat tta ctt  ggg gta act       5264
Leu Arg  Cys Ala Ala Leu Phe  Phe His Tyr Leu Leu  Gly Val Thr
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gca ctc tgt agc tat cta tct  tta cct aca aat ttg  ttc ctg ctc        5354
Ala Leu Cys Ser Tyr Leu Ser  Leu Pro Thr Asn Leu  Phe Leu Leu
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ttc cag gaa tat tgg gat act  gta agg ccc ttg ctc  cag agg tgg        5399
Phe Gln Glu Tyr Trp Asp Thr  Val Arg Pro Leu Leu  Gln Arg Trp
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Cys Ala Asp Pro Ala Leu Leu  Asn Cys Leu Lys Gln  Lys Asn Thr
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gtg gtc agg tac cct aga aaa  aga aat agt ttg ata  gag ctt cct        5489
Val Val Arg Tyr Pro Arg Lys  Arg Asn Ser Leu Ile  Glu Leu Pro
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gat gac tat agc tgc ctc ctg  aat caa gct tct cat  ttc agg tgc        5534
Asp Asp Tyr Ser Cys Leu Leu  Asn Gln Ala Ser His  Phe Arg Cys
    1600            1605               1610

cca cgg tct gca gat gat gag  cga aag cat cct gtc  ctc tgc ctt        557.9
Pro Arg Ser Ala Asp Asp Glu  Arg Lys His Pro Val  Leu Cys Leu
    1615            1620               1625

ttc tgt ggg gct ata cta tgt  tct cag aac att tgc  tgc cag gaa        5624
Phe Cys Gly Ala Ile Leu Cys  Ser Gln Asn Ile Cys  Cys Gln Glu
    1630            1635               1640

att gtg aac ggg gaa gag gtt  gga gct tgc att ttt  cac gca ctt        5669
Ile Val Asn Gly Glu Glu Val  Gly Ala Cys Ile Phe  His Ala Leu
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cac tgt gga gcc gga gtc tgc  att ttc cta aaa atc  aga gaa tgc        5714
His Cys Gly Ala Gly Val Cys  Ile Phe Leu Lys Ile  Arg Glu Cys
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cga gtg gtc ctg gtt gaa ggt  aaa gcc aga ggc tgt  gcc tat cca        5759
Arg Val Val Leu Val Glu Gly  Lys Ala Arg Gly Cys  Ala Tyr Pro
    1675            1680               1685

gct cct tac ttg gat gaa tat  gga gaa aca gac cct  ggc ctg aag        5804
Ala Pro Tyr Leu Asp Glu Tyr  Gly Glu Thr Asp Pro  Gly Leu Lys
    1690            1695               1700

agg ggc aac ccc ctt cat tta  tct cgt gag cgg tat  cgg aag ctc        5849
Arg Gly Asn Pro Leu His Leu  Ser Arg Glu Arg Tyr  Arg Lys Leu
    1705            1710               1715

cat ttg gtc tgg caa caa cac  tgc att ata gaa gag  att gct agg        5894
His Leu Val Trp Gln Gln His  Cys Ile Ile Glu Glu  Ile Ala Arg
    1720            1725               1730

agc caa gag act aat cag atg  tta ttt gga ttc aac  tgg cag tta        5939
Ser Gln Glu Thr Asn Gln Met  Leu Phe Gly Phe Asn  Trp Gln Leu
    1735            1740               1745

ctg tgagctccaa ctctgcctca agacaatcac aaatgacgac agtagtaaag          5992
Leu
```

```
gctgattcaa aattatggaa aactttctga gggctgggaa agtattggag ggtcttttgc    6052

tccatgtcca ggttcactta catcaataaa atatttctta atggagtatt gctttcaatt    6112

agcaaacata tgcttcacag gaaaaaagga catagatcaa tctgttttat gtgctagtat    6172

ttccaggaat ttattcccct tcataatttg tctcatttca ttttatttca tccacttggt    6232

agatgaagtc acgtcaaaca gttgtagaca ttttatgtgt tggttaactc ttctgcaatt    6292

ttgtatttgg tgtttt                                                    6308
```

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<210>   2
<211>   1749
<212>   PRT
<213>   Homo sapiens

<400>   2
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Met Ala Asp Glu Glu Ala Gly Gly Thr Glu Arg Met Glu Ile Ser Ala
1               5                   10                  15


Glu Leu Pro Gln Thr Pro Gln Arg Leu Ala Ser Trp Trp Asp Gln Gln
            20                  25                  30


Val Asp Phe Tyr Thr Ala Phe Leu His His Leu Ala Gln Leu Val Pro
            35                  40                  45


Glu Ile Tyr Phe Ala Glu Met Asp Pro Asp Leu Glu Lys Gln Glu Glu
        50                  55                  60


Ser Val Gln Met Ser Ile Phe Thr Pro Leu Glu Trp Tyr Leu Phe Gly
65                  70                  75                  80


Glu Asp Pro Asp Ile Cys Leu Glu Lys Leu Lys His Ser Gly Ala Phe
                85                  90                  95


Gln Leu Cys Gly Arg Val Phe Lys Ser Gly Glu Thr Thr Tyr Ser Cys
            100                 105                 110


Arg Asp Cys Ala Ile Asp Pro Thr Cys Val Leu Cys Met Asp Cys Phe
            115                 120                 125


Gln Asp Ser Val His Lys Asn His Arg Tyr Lys Met His Thr Ser Thr
        130                 135                 140


Gly Gly Gly Phe Cys Asp Cys Gly Asp Thr Glu Ala Trp Lys Thr Gly
145                 150                 155                 160


Pro Phe Cys Val Asn His Glu Pro Gly Arg Ala Gly Thr Ile Lys Glu
                165                 170                 175
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Asn Ser Arg Cys Pro Leu Asn Glu Glu Val Ile Val Gln Ala Arg Lys
        180             185             190

Ile Phe Pro Ser Val Ile Lys Tyr Val Val Glu Met Thr Ile Trp Glu
        195             200             205

Glu Glu Lys Glu Leu Pro Pro Glu Leu Gln Ile Arg Glu Lys Asn Glu
    210             215             220

Arg Tyr Tyr Cys Val Leu Phe Asn Asp Glu His His Ser Tyr Asp His
225             230             235             240

Val Ile Tyr Ser Leu Gln Arg Ala Leu Asp Cys Glu Leu Ala Glu Ala
            245             250             255

Gln Leu His Thr Thr Ala Ile Asp Lys Glu Gly Arg Arg Ala Val Lys
        260             265             270

Ala Gly Ala Tyr Ala Ala Cys Gln Glu Ala Lys Glu Asp Ile Lys Ser
        275             280             285

His Ser Glu Asn Val Ser Gln His Pro Leu His Val Glu Val Leu His
    290             295             300

Ser Glu Ile Met Ala His Gln Lys Phe Ala Leu Arg Leu Gly Ser Trp
305             310             315             320

Met Asn Lys Ile Met Ser Tyr Ser Ser Asp Phe Arg Gln Ile Phe Cys
                325             330             335

Gln Ala Cys Leu Arg Glu Glu Pro Asp Ser Glu Asn Pro Cys Leu Ile
        340             345             350

Ser Arg Leu Met Leu Trp Asp Ala Lys Leu Tyr Lys Gly Ala Arg Lys
        355             360             365

Ile Leu His Glu Leu Ile Phe Ser Ser Phe Phe Met Glu Met Glu Tyr
    370             375             380

Lys Lys Leu Phe Ala Met Glu Phe Val Lys Tyr Tyr Lys Gln Leu Gln
385             390             395             400

Lys Glu Tyr Ile Ser Asp Asp His Asp Arg Ser Ile Ser Ile Thr Ala
            405             410             415

Leu Ser Val Gln Met Phe Thr Val Pro Thr Leu Ala Arg His Leu Ile
        420             425             430
```

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Glu Glu Gln Asn Val Ile Ser Val Ile Thr Glu Thr Leu Leu Glu Val
        435             440             445

Leu Pro Glu Tyr Leu Asp Arg Asn Asn Lys Phe Asn Phe Gln Gly Tyr
        450             455             460

Ser Gln Asp Lys Leu Gly Arg Val Tyr Ala Val Ile Cys Asp Leu Lys
465             470             475             480

Tyr Ile Leu Ile Ser Lys Pro Thr Ile Trp Thr Glu Arg Leu Arg Met
                485             490             495

Gln Phe Leu Glu Gly Phe Arg Ser Phe Leu Lys Ile Leu Thr Cys Met
        500             505             510

Gln Gly Met Glu Glu Ile Arg Arg Gln Val Gly Gln His Ile Glu Val
        515             520             525

Asp Pro Asp Trp Glu Ala Ala Ile Ala Ile Gln Met Gln Leu Lys Asn
        530             535             540

Ile Leu Leu Met Phe Gln Glu Trp Cys Ala Cys Asp Glu Glu Leu Leu
545             550             555             560

Leu Val Ala Tyr Lys Glu Cys His Lys Ala Val Met Arg Cys Ser Thr
                565             570             575

Ser Phe Ile Ser Ser Ser Lys Thr Val Val Gln Ser Cys Gly His Ser
        580             585             590

Leu Glu Thr Lys Ser Tyr Arg Val Ser Glu Asp Leu Val Ser Ile His
        595             600             605

Leu Pro Leu Ser Arg Thr Leu Ala Gly Leu His Val Arg Leu Ser Arg
        610             615             620

Leu Gly Ala Val Ser Arg Leu His Glu Phe Val Ser Phe Glu Asp Phe
625             630             635             640

Gln Val Glu Val Leu Val Glu Tyr Pro Leu Arg Cys Leu Val Leu Val
                645             650             655

Ala Gln Val Val Ala Glu Met Trp Arg Arg Asn Gly Leu Ser Leu Ile
        660             665             670

Ser Gln Val Phe Tyr Tyr Gln Asp Val Lys Cys Arg Glu Glu Met Tyr
        675             680             685
```

```
Asp Lys Asp Ile Ile Met Leu Gln Ile Gly Ala Ser Leu Met Asp Pro
    690             695             700

Asn Lys Phe Leu Leu Leu Val Leu Gln Arg Tyr Glu Leu Ala Glu Ala
705             710             715             720

Phe Asn Lys Thr Ile Ser Thr Lys Asp Gln Asp Leu Ile Lys Gln Tyr
                725             730             735

Asn Thr Leu Ile Glu Glu Met Leu Gln Val Leu Ile Tyr Ile Val Gly
            740             745             750

Glu Arg Tyr Val Pro Gly Val Gly Asn Val Thr Lys Glu Glu Val Thr
        755             760             765

Met Arg Glu Ile Ile His Leu Leu Cys Ile Glu Pro Met Pro His Ser
    770             775             780

Ala Ile Ala Lys Asn Leu Pro Glu Asn Glu Asn Asn Glu Thr Gly Leu
785             790             795             800

Glu Asn Val Ile Asn Lys Val Ala Thr Phe Lys Lys Pro Gly Val Ser
            805             810             815

Gly His Gly Val Tyr Glu Leu Lys Asp Glu Ser Leu Lys Asp Phe Asn
            820             825             830

Met Tyr Phe Tyr His Tyr Ser Lys Thr Gln His Ser Lys Ala Glu His
    835             840             845

Met Gln Lys Lys Arg Arg Lys Gln Glu Asn Lys Asp Glu Ala Leu Pro
    850             855             860

Pro Pro Pro Pro Pro Glu Phe Cys Pro Ala Phe Ser Lys Val Ile Asn
865             870             875             880

Leu Leu Asn Cys Asp Ile Met Met Tyr Ile Leu Arg Thr Val Phe Glu
            885             890             895

Arg Ala Ile Asp Thr Asp Ser Asn Leu Trp Thr Glu Gly Met Leu Gln
        900             905             910

Met Ala Phe His Ile Leu Ala Leu Gly Leu Leu Glu Glu Lys Gln Gln
    915             920             925

Leu Gln Lys Ala Pro Glu Glu Glu Val Thr Phe Asp Phe Tyr His Lys
    930             935             940
```

```
Ala Ser Arg Leu Gly Ser Ser Ala Met Asn Ile Gln Met Leu Leu Glu
945                 950                 955                 960


Lys Leu Lys Gly Ile Pro Gln Leu Glu Gly Gln Lys Asp Met Ile Thr
                965                 970                 975


Trp Ile Leu Gln Met Phe Asp Thr Val Lys Arg Leu Arg Glu Lys Ser
            980                 985                 990


Cys Leu Ile Val Ala Thr Thr Ser  Gly Ser Glu Ser Ile  Lys Asn Asp
        995                 1000                1005


Glu Ile  Thr His Asp Lys Glu  Lys Ala Glu Arg Lys  Arg Lys Ala
    1010                1015                1020


Glu Ala  Ala Arg Leu His Arg  Gln Lys Ile Met Ala  Gln Met Ser
    1025                1030                1035


Ala Leu  Gln Lys Asn Phe Ile  Glu Thr His Lys Leu  Met Tyr Asp
    1040                1045                1050


Asn Thr  Ser Glu Met Pro Gly  Lys Glu Asp Ser Ile  Met Glu Glu
    1055                1060                1065


Glu Ser  Thr Pro Ala Val Ser  Asp Tyr Ser Arg Ile  Ala Leu Gly
    1070                1075                1080


Pro Lys  Arg Gly Pro Ser Val  Thr Glu Lys Glu Val  Leu Thr Cys
    1085                1090                1095


Ile Leu  Cys Gln Glu Glu Gln  Glu Val Lys Ile Glu  Asn Asn Ala
    1100                1105                1110


Met Val  Leu Ser Ala Cys Val  Gln Lys Ser Thr Ala  Leu Thr Gln
    1115                1120                1125


His Arg  Gly Lys Pro Ile Glu  Leu Ser Gly Glu Ala  Leu Asp Pro
    1130                1135                1140


Leu Phe  Met Asp Pro Asp Leu  Ala Tyr Gly Thr Tyr  Thr Gly Ser
    1145                1150                1155


Cys Gly  His Val Met His Ala  Val Cys Trp Gln Lys  Tyr Phe Glu
    1160                1165                1170


Ala Val  Gln Leu Ser Ser Gln  Gln Arg Ile His Val  Asp Leu Phe
    1175                1180                1185
```

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```
Asp Leu Glu Ser Gly Glu Tyr  Leu Cys Pro Leu Cys  Lys Ser Leu
    1190            1195                 1200

Cys Asn Thr Val Ile Pro Ile  Ile Pro Leu Gln Pro  Gln Lys Ile
    1205            1210                 1215

Asn Ser Glu Asn Ala Asp Ala  Leu Ala Gln Leu Leu  Thr Leu Ala
    1220            1225                 1230

Arg Trp Ile Gln Thr Val Leu  Ala Arg Ile Ser Gly  Tyr Asn Ile
    1235            1240                 1245

Arg His Ala Lys Gly Glu Asn  Pro Ile Pro Ile Phe  Phe Asn Gln
    1250            1255                 1260

Gly Met Gly Asp Ser Thr Leu  Glu Phe His Ser Ile  Leu Ser Phe
    1265            1270                 1275

Gly Val Glu Ser Ser Ile Lys  Tyr Ser Asn Ser Ile  Lys Glu Met
    1280            1285                 1290

Val Ile Leu Phe Ala Thr Thr  Ile Tyr Arg Ile Gly  Leu Lys Val
    1295            1300                 1305

Pro Pro Asp Glu Arg Asp Pro  Arg Val Pro Met Leu  Thr Trp Ser
    1310            1315                 1320

Thr Cys Ala Phe Thr Ile Gln  Ala Ile Glu Asn Leu  Leu Gly Asp
    1325            1330                 1335

Glu Gly Lys Pro Leu Phe Gly  Ala Leu Gln Asn Arg  Gln His Asn
    1340            1345                 1350

Gly Leu Lys Ala Leu Met Gln  Phe Ala Val Ala Gln  Arg Ile Thr
    1355            1360                 1365

Cys Pro Gln Val Leu Ile Gln  Lys His Leu Val Arg  Leu Leu Ser
    1370            1375                 1380

Val Val Leu Pro Asn Ile Lys  Ser Glu Asp Thr Pro  Cys Leu Leu
    1385            1390                 1395

Ser Ile Asp Leu Phe His Val  Leu Val Gly Ala Val  Leu Ala Phe
    1400            1405                 1410

Pro Ser Leu Tyr Trp Asp Asp  Pro Val Asp Leu Gln  Pro Ser Ser
    1415            1420                 1425
```

```
Val Ser  Ser Ser Tyr Asn His  Leu Tyr Leu Phe His  Leu Ile Thr
    1430             1435             1440

Met Ala  His Met Leu Gln Ile  Leu Leu Thr Val Asp  Thr Gly Leu
    1445             1450             1455

Pro Leu  Ala Gln Val Gln Glu  Asp Ser Glu Glu Ala  His Ser Ala
    1460             1465             1470

Ser Ser  Phe Phe Ala Glu Ile  Ser Gln Tyr Thr Ser  Gly Ser Ile
    1475             1480             1485

Gly Cys  Asp Ile Pro Gly Trp  Tyr Leu Trp Val Ser  Leu Lys Asn
    1490             1495             1500

Gly Ile  Thr Pro Tyr Leu Arg  Cys Ala Ala Leu Phe  Phe His Tyr
    1505             1510             1515

Leu Leu  Gly Val Thr Pro Pro  Glu Glu Leu His Thr  Asn Ser Ala
    1520             1525             1530

Glu Gly  Glu Tyr Ser Ala Leu  Cys Ser Tyr Leu Ser  Leu Pro Thr
    1535             1540             1545

Asn Leu  Phe Leu Leu Phe Gln  Glu Tyr Trp Asp Thr  Val Arg Pro
    1550             1555             1560

Leu Leu  Gln Arg Trp Cys Ala  Asp Pro Ala Leu Leu  Asn Cys Leu
    1565             1570             1575

Lys Gln  Lys Asn Thr Val Val  Arg Tyr Pro Arg Lys  Arg Asn Ser
    1580             1585             1590

Leu Ile  Glu Leu Pro Asp Asp  Tyr Ser Cys Leu Leu  Asn Gln Ala
    1595             1600             1605

Ser His  Phe Arg Cys Pro Arg  Ser Ala Asp Asp Glu  Arg Lys His
    1610             1615             1620

Pro Val  Leu Cys Leu Phe Cys  Gly Ala Ile Leu Cys  Ser Gln Asn
    1625             1630             1635

Ile Cys  Cys Gln Glu Ile Val  Asn Gly Glu Glu Val  Gly Ala Cys
    1640             1645             1650

Ile Phe  His Ala Leu His Cys  Gly Ala Gly Val Cys  Ile Phe Leu
    1655             1660             1665
```

```
Lys Ile  Arg Glu Cys Arg Val  Val Leu Val Glu Gly  Lys Ala Arg
    1670                 1675             1680

Gly Cys  Ala Tyr Pro Ala Pro  Tyr Leu Asp Glu Tyr  Gly Glu Thr
    1685                 1690             1695

Asp Pro  Gly Leu Lys Arg Gly  Asn Pro Leu His Leu  Ser Arg Glu
    1700                 1705             1710

Arg Tyr  Arg Lys Leu His Leu  Val Trp Gln Gln His  Cys Ile Ile
    1715                 1720             1725

Glu Glu  Ile Ala Arg Ser Gln  Glu Thr Asn Gln Met  Leu Phe Gly
    1730                 1735             1740

Phe Asn  Trp Gln Leu Leu
    1745
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gacgagccag tgacttgact cttgggcgct aagcttggga gggagcgcag gaggccgctg     120

tccttccttt ccggttcacg tcacccttct ctccctctgt tgctccacct gcagccactt     180

ggacggctcc gggactgatt gcctggggca ggggtggcag tcgaggccgc cggggccgag     240

gtgaggctgc agctctccgg gcggcggtag cgctggggag gaggaggaga gaag atg      297
                                                              Met
                                                              1

gcg tcg gag cta gag cca gag gtg cag gcc atc gac cgg agt ttg ctg      345
Ala Ser Glu Leu Glu Pro Glu Val Gln Ala Ile Asp Arg Ser Leu Leu
            5                   10                  15

gaa tgt tcg gcc gag gag att gcg ggg aaa tgg ctg caa gca act gac      393
Glu Cys Ser Ala Glu Glu Ile Ala Gly Lys Trp Leu Gln Ala Thr Asp
        20                  25                  30

ctc act aga gaa gtg tac cag cat tta gcc cac tat gta ccc aaa atc      441
Leu Thr Arg Glu Val Tyr Gln His Leu Ala His Tyr Val Pro Lys Ile
    35                  40                  45

tac tgc agg ggt ccc aac cct ttt cca cag aaa gaa gac atg ctg gca      489
Tyr Cys Arg Gly Pro Asn Pro Phe Pro Gln Lys Glu Asp Met Leu Ala
50                  55                  60                  65
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cag cat gtt ttg ttg gga cca atg gaa tgg tac ctt tgt ggt gaa gat       537
Gln His Val Leu Leu Gly Pro Met Glu Trp Tyr Leu Cys Gly Glu Asp
                70                  75                  80

cct gca ttt gga ttt cca aaa ctt gag caa gca aac aaa cct tct cat       585
Pro Ala Phe Gly Phe Pro Lys Leu Glu Gln Ala Asn Lys Pro Ser His
            85                  90                  95

ctt tgt ggt cgt gtt ttt aaa gta gga gag cct aca tat tct tgc aga       633
Leu Cys Gly Arg Val Phe Lys Val Gly Glu Pro Thr Tyr Ser Cys Arg
            100                 105                 110

gac tgt gca gtt gat cca act tgt gtt ttg tgc atg gag tgc ttt ttg       681
Asp Cys Ala Val Asp Pro Thr Cys Val Leu Cys Met Glu Cys Phe Leu
            115                 120                 125

gga agt att cac aga gat cat cga tat agg atg aca aca tca gga ggt       729
Gly Ser Ile His Arg Asp His Arg Tyr Arg Met Thr Thr Ser Gly Gly
130                 135                 140                 145

gga ggt ttc tgt gac tgt ggt gat act gaa gcc tgg aaa gag ggt cct       777
Gly Gly Phe Cys Asp Cys Gly Asp Thr Glu Ala Trp Lys Glu Gly Pro
            150                 155                 160

tac tgt caa aaa cat gaa ctt aac acc tct gaa att gag gaa gaa gag       825
Tyr Cys Gln Lys His Glu Leu Asn Thr Ser Glu Ile Glu Glu Glu Glu
            165                 170                 175

gat cct ctt gtt cat tta tca gaa gat gtg ata gca aga act tat aac       873
Asp Pro Leu Val His Leu Ser Glu Asp Val Ile Ala Arg Thr Tyr Asn
            180                 185                 190

att ttt gct att acg ttt cgg tat gca gta gaa ata tta acc tgg gaa       921
Ile Phe Ala Ile Thr Phe Arg Tyr Ala Val Glu Ile Leu Thr Trp Glu
            195                 200                 205

aaa gaa agt gaa ttg cca gca gat tta gag atg gta gag aag agt gac       969
Lys Glu Ser Glu Leu Pro Ala Asp Leu Glu Met Val Glu Lys Ser Asp
210                 215                 220                 225

acc tac tat tgc atg ctg ttt aat gat gag gtt cac acc tat gaa caa      1017
Thr Tyr Tyr Cys Met Leu Phe Asn Asp Glu Val His Thr Tyr Glu Gln
            230                 235                 240

gtt att tat act ctt cag aaa gct gtt aac tgt aca caa aaa gaa gct      1065
Val Ile Tyr Thr Leu Gln Lys Ala Val Asn Cys Thr Gln Lys Glu Ala
            245                 250                 255

att ggt ttt gca act aca gta gat cga gat ggg cgt agg tct gtt cga      1113
Ile Gly Phe Ala Thr Thr Val Asp Arg Asp Gly Arg Arg Ser Val Arg
            260                 265                 270

tat gga gat ttt cag tat tgt gag caa gca aaa tca gta att gtg aga      1161
Tyr Gly Asp Phe Gln Tyr Cys Glu Gln Ala Lys Ser Val Ile Val Arg
            275                 280                 285

aat acc agt aga cag aca aag cca ctc aaa gtt caa gtt atg cat tcg      1209
Asn Thr Ser Arg Gln Thr Lys Pro Leu Lys Val Gln Val Met His Ser
290                 295                 300                 305

tct att gtc gca cat cag aat ttt ggt ttg aaa ctt ttg tct tgg ctg      1257
Ser Ile Val Ala His Gln Asn Phe Gly Leu Lys Leu Leu Ser Trp Leu
            310                 315                 320
```

```
gga agt att att gga tat tca gat ggc ctt cgc cgg att tta tgt caa          1305
Gly Ser Ile Ile Gly Tyr Ser Asp Gly Leu Arg Arg Ile Leu Cys Gln
            325                 330                 335

gtt ggt tta caa gaa ggg cca gat ggt gaa aac tct tct cta gtg gac          1353
Val Gly Leu Gln Glu Gly Pro Asp Gly Glu Asn Ser Ser Leu Val Asp
            340                 345                 350

aga ctg atg ctt agt gat tcc aaa tta tgg aaa ggt gct agg agt gta          1401
Arg Leu Met Leu Ser Asp Ser Lys Leu Trp Lys Gly Ala Arg Ser Val
            355                 360                 365

tat cat cag ttg ttc atg agc agt ctg ctt atg gat ttg aaa tac aag          1449
Tyr His Gln Leu Phe Met Ser Ser Leu Leu Met Asp Leu Lys Tyr Lys
370                 375                 380                 385

aaa cta ttt gct gtt cga ttt gca aaa aat tac cag cag ttg cag aga          1497
Lys Leu Phe Ala Val Arg Phe Ala Lys Asn Tyr Gln Gln Leu Gln Arg
            390                 395                 400

gat ttt atg gag gat gat cac gag cga gca gtg tcg gtg act gct cta          1545
Asp Phe Met Glu Asp Asp His Glu Arg Ala Val Ser Val Thr Ala Leu
            405                 410                 415

tct gtc cag ttc ttc acc gca cct act ctg gct cga atg ctc atc aca          1593
Ser Val Gln Phe Phe Thr Ala Pro Thr Leu Ala Arg Met Leu Ile Thr
            420                 425                 430

gaa gaa aac ttg atg agc att atc att aag act ttt atg gat cat ttg          1641
Glu Glu Asn Leu Met Ser Ile Ile Ile Lys Thr Phe Met Asp His Leu
            435                 440                 445

aga cat cga gat gcc cag ggc aga ttt cag ttt gaa cga tac act gct          1689
Arg His Arg Asp Ala Gln Gly Arg Phe Gln Phe Glu Arg Tyr Thr Ala
450                 455                 460                 465

tta caa gcc ttc aaa ttt agg aga gta cag agc ctt att tta gat ctc          1737
Leu Gln Ala Phe Lys Phe Arg Arg Val Gln Ser Leu Ile Leu Asp Leu
            470                 475                 480

aag tat gtg tta att agc aaa cca act gaa tgg tca gat gag ctg agg          1785
Lys Tyr Val Leu Ile Ser Lys Pro Thr Glu Trp Ser Asp Glu Leu Arg
            485                 490                 495

cag aag ttc cta gaa ggg ttt gat gcc ttt ttg gaa tta cta aaa tgt          1833
Gln Lys Phe Leu Glu Gly Phe Asp Ala Phe Leu Glu Leu Leu Lys Cys
            500                 505                 510

atg cag gga atg gat cca att aca cgt caa gta gga caa cat att gaa          1881
Met Gln Gly Met Asp Pro Ile Thr Arg Gln Val Gly Gln His Ile Glu
            515                 520                 525

atg gaa cca gag tgg gaa gca gcc ttc aca cta caa atg aaa tta aca          1929
Met Glu Pro Glu Trp Glu Ala Ala Phe Thr Leu Gln Met Lys Leu Thr
530                 535                 540                 545

cat gtc att tca atg atg cag gac tgg tgt gct tca gat gaa aaa gtg          1977
His Val Ile Ser Met Met Gln Asp Trp Cys Ala Ser Asp Glu Lys Val
            550                 555                 560

tta atc gaa gct tac aag aaa tgt ctc gct gta ctg atg cag tgt cat          2025
Leu Ile Glu Ala Tyr Lys Lys Cys Leu Ala Val Leu Met Gln Cys His
            565                 570                 575
```

```
ggt ggt tat act gat ggt gaa cag cca atc aca cta agc att tgt gga      2073
Gly Gly Tyr Thr Asp Gly Glu Gln Pro Ile Thr Leu Ser Ile Cys Gly
        580                 585                 590

cat tca gtg gaa act atc aga tac tgt gtt tcc caa gaa aaa gtt agc      2121
His Ser Val Glu Thr Ile Arg Tyr Cys Val Ser Gln Glu Lys Val Ser
        595                 600                 605

att cac ctc cca gtt tct cgc tta ctt gca ggt tta cat gta tta tta      2169
Ile His Leu Pro Val Ser Arg Leu Leu Ala Gly Leu His Val Leu Leu
610                 615                 620                 625

agc aaa agt gaa gtg gca tat aaa ttt cca gag ctc cta cct cta agt      2217
Ser Lys Ser Glu Val Ala Tyr Lys Phe Pro Glu Leu Leu Pro Leu Ser
                630                 635                 640

gaa ctt agc cca ccc atg ttg ata gaa cac cct ctt aga tgt ctt gtt      2265
Glu Leu Ser Pro Pro Met Leu Ile Glu His Pro Leu Arg Cys Leu Val
            645                 650                 655

ctg tgt gcc caa gta cat gcc gga atg tgg aga aga aat ggg ttc tct      2313
Leu Cys Ala Gln Val His Ala Gly Met Trp Arg Arg Asn Gly Phe Ser
            660                 665                 670

cta gta aac cag att tat tac tac cat aat gtg aaa tgc aga cgt gag      2361
Leu Val Asn Gln Ile Tyr Tyr Tyr His Asn Val Lys Cys Arg Arg Glu
        675                 680                 685

atg ttt gac aag gat gta gta atg ctt cag aca ggt gtc tcc atg atg      2409
Met Phe Asp Lys Asp Val Val Met Leu Gln Thr Gly Val Ser Met Met
690                 695                 700                 705

gat cca aat cat ttc ctg atg atc atg ctc agc cgc ttt gaa ctt tat      2457
Asp Pro Asn His Phe Leu Met Ile Met Leu Ser Arg Phe Glu Leu Tyr
                710                 715                 720

cag att ttc agt act cca gac tat gga aaa aga ttt agt tct gag att      2505
Gln Ile Phe Ser Thr Pro Asp Tyr Gly Lys Arg Phe Ser Ser Glu Ile
            725                 730                 735

acc cat aag gat gtt gtt cag cag aac aat act cta ata gaa gaa atg      2553
Thr His Lys Asp Val Val Gln Gln Asn Asn Thr Leu Ile Glu Glu Met
            740                 745                 750

cta tac ctc att ata atg ctt gtt gga gag aga ttt agt cct gga gtt      2601
Leu Tyr Leu Ile Ile Met Leu Val Gly Glu Arg Phe Ser Pro Gly Val
            755                 760                 765

gga cag gta aat gct aca gat gaa atc aag cga gag att atc cat cag      2649
Gly Gln Val Asn Ala Thr Asp Glu Ile Lys Arg Glu Ile Ile His Gln
770                 775                 780                 785

ttg agt atc aag cct atg gct cat agt gaa ttg gta aag tct tta cct      2697
Leu Ser Ile Lys Pro Met Ala His Ser Glu Leu Val Lys Ser Leu Pro
                790                 795                 800

gaa gat gag aac aag gag act ggc atg gag agt gta atc gaa gca gtt      2745
Glu Asp Glu Asn Lys Glu Thr Gly Met Glu Ser Val Ile Glu Ala Val
                805                 810                 815

gcc cat ttc aag aaa cct gga tta aca gga cga ggc atg tat gaa ctg      2793
Ala His Phe Lys Lys Pro Gly Leu Thr Gly Arg Gly Met Tyr Glu Leu
        820                 825                 830
```

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```
aaa cca gaa tgt gcc aaa gag ttc aac ttg tat ttc tat cac ttt tca    2841
Lys Pro Glu Cys Ala Lys Glu Phe Asn Leu Tyr Phe Tyr His Phe Ser
    835             840             845

agg gca gaa cag tcc aag gca gaa gaa gcg caa cgg aaa ttg aaa aga    2889
Arg Ala Glu Gln Ser Lys Ala Glu Glu Ala Gln Arg Lys Leu Lys Arg
850             855             860             865

caa aat aga gaa gat aca gca ctc cca cct ccg gtg ttg cct cca ttc    2937
Gln Asn Arg Glu Asp Thr Ala Leu Pro Pro Pro Val Leu Pro Pro Phe
            870             875             880

tgc cct ctg ttt gca agc ctg gtt aac att ttg cag tca gat gtc atg    2985
Cys Pro Leu Phe Ala Ser Leu Val Asn Ile Leu Gln Ser Asp Val Met
            885             890             895

ttg tgc atc atg gga aca att ctg caa tgg gct gtg gaa cat aat gga    3033
Leu Cys Ile Met Gly Thr Ile Leu Gln Trp Ala Val Glu His Asn Gly
        900             905             910

tat gcc tgg tca gag tcc atg ctg caa agg gtg tta cat tta att ggc    3081
Tyr Ala Trp Ser Glu Ser Met Leu Gln Arg Val Leu His Leu Ile Gly
    915             920             925

atg gca cta caa gaa gaa aaa caa cat tta gag aat gtc acg gaa gag    3129
Met Ala Leu Gln Glu Glu Lys Gln His Leu Glu Asn Val Thr Glu Glu
930             935             940             945

cat gta gta aca ttt acc ttc act cag aag ata tca aaa cct ggt gaa    3177
His Val Val Thr Phe Thr Phe Thr Gln Lys Ile Ser Lys Pro Gly Glu
            950             955             960

gcg cca aaa aat tct cct agc ata cta gct atg ctg gaa aca cta caa    3225
Ala Pro Lys Asn Ser Pro Ser Ile Leu Ala Met Leu Glu Thr Leu Gln
            965             970             975

aat gct ccc tac cta gaa gtc cac aaa gac atg att cgg tgg ata ttg    3273
Asn Ala Pro Tyr Leu Glu Val His Lys Asp Met Ile Arg Trp Ile Leu
            980             985             990

aag act ttt aat gct gtt aaa aag atg agg gag agt tca cct acc agt    3321
Lys Thr Phe Asn Ala Val Lys Lys Met Arg Glu Ser Ser Pro Thr Ser
        995             1000            1005

ccc gtg gca gag aca gaa gga acc ata atg gaa gag agt tca agg        3366
Pro Val Ala Glu Thr Glu Gly Thr Ile Met Glu Glu Ser Ser Arg
1010            1015            1020

gac aaa gac aaa gct gag agg aag aga aaa gca gag att gcc aga        3411
Asp Lys Asp Lys Ala Glu Arg Lys Arg Lys Ala Glu Ile Ala Arg
1025            1030            1035

ctg cgc aga gaa aag atc atg gct cag atg tct gaa atg cag cgg        3456
Leu Arg Arg Glu Lys Ile Met Ala Gln Met Ser Glu Met Gln Arg
1040            1045            1050

cat ttt att gat gaa aac aaa gaa ctc ttt cag cag aca tta gaa        3501
His Phe Ile Asp Glu Asn Lys Glu Leu Phe Gln Gln Thr Leu Glu
1055            1060            1065

ctg gat gcc tca acc tct gct gtt ctt gat cat agc cct gtg gct        3546
Leu Asp Ala Ser Thr Ser Ala Val Leu Asp His Ser Pro Val Ala
1070            1075            1080
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tca gat atg aca ctt aca  gca ctg ggt ccc aca  caa act cag gtt        3591
Ser Asp Met Thr Leu Thr  Ala Leu Gly Pro Thr  Gln Thr Gln Val
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cct gaa caa aga caa ttc  gtt aca tgt ata ttg  tgt caa gag gag        3636
Pro Glu Gln Arg Gln Phe  Val Thr Cys Ile Leu  Cys Gln Glu Glu
1100             1105               1110

caa gaa gtt aaa gtg gaa  agc agg gca atg gtc  ttg gca gca ttt        3681
Gln Glu Val Lys Val Glu  Ser Arg Ala Met Val  Leu Ala Ala Phe
1115             1120               1125

gtt cag aga tca act gta  tta tca aaa aac aga  agt aaa ttt att        3726
Val Gln Arg Ser Thr Val  Leu Ser Lys Asn Arg  Ser Lys Phe Ile
1130             1135               1140

caa gat cca gaa aaa tat  gat cca tta ttc atg  cac cct gat ctg        3771
Gln Asp Pro Glu Lys Tyr  Asp Pro Leu Phe Met  His Pro Asp Leu
1145             1150               1155

tct tgt gga aca cac act  agt agc tgt ggg cac  att atg cat gcc        3816
Ser Cys Gly Thr His Thr  Ser Ser Cys Gly His  Ile Met His Ala
1160             1165               1170

cat tgt tgg caa agg tat  ttt gat tcc gtt caa  gct aaa gaa cag        3861
His Cys Trp Gln Arg Tyr  Phe Asp Ser Val Gln  Ala Lys Glu Gln
1175             1180               1185

cga agg caa cag aga tta  cgc tta cat acg agc  tat gat gta gaa        3906
Arg Arg Gln Gln Arg Leu  Arg Leu His Thr Ser  Tyr Asp Val Glu
1190             1195               1200

aac gga gaa ttc ctt tgc  ccc ctt tgt gaa tgc  ttg agt aat act        3951
Asn Gly Glu Phe Leu Cys  Pro Leu Cys Glu Cys  Leu Ser Asn Thr
1205             1210               1215

gtt att cct ctg ctg ctt  cct cca aga aat att  ttt aac aac agg        3996
Val Ile Pro Leu Leu Leu  Pro Pro Arg Asn Ile  Phe Asn Asn Arg
1220             1225               1230

tta aat ttt tca gac caa  cca aat ctg act cag  tgg att aga aca        4041
Leu Asn Phe Ser Asp Gln  Pro Asn Leu Thr Gln  Trp Ile Arg Thr
1235             1240               1245

ata tct cag caa ata aaa  gca tta cag ttt ctt  agg aaa gaa gaa        4086
Ile Ser Gln Gln Ile Lys  Ala Leu Gln Phe Leu  Arg Lys Glu Glu
1250             1255               1260

agt act cct aat aat gcc  tct aca aag aat tca  gaa aat gtg gat        4131
Ser Thr Pro Asn Asn Ala  Ser Thr Lys Asn Ser  Glu Asn Val Asp
1265             1270               1275

gaa tta cag ctc cct gaa  ggg ttc agg cct gat  ttt cgt cct aag        4176
Glu Leu Gln Leu Pro Glu  Gly Phe Arg Pro Asp  Phe Arg Pro Lys
1280             1285               1290

atc cct tat tct gag agc  ata aaa gaa atg cta  acg aca ttt gga        4221
Ile Pro Tyr Ser Glu Ser  Ile Lys Glu Met Leu  Thr Thr Phe Gly
1295             1300               1305

act gct acc tac aag gtg  gga cta aag gtt cat  ccc aat gaa gag        4266
Thr Ala Thr Tyr Lys Val  Gly Leu Lys Val His  Pro Asn Glu Glu
1310             1315               1320
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Asp  Pro  Arg  Val  Pro  Ile  Met  Cys  Trp  Gly  Ser  Cys  Ala  Tyr  Thr
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atc  caa  agc  ata  gaa  aga  att  ttg  agt  gat  gaa  gat  aaa  cca  ttg        4356
Ile  Gln  Ser  Ile  Glu  Arg  Ile  Leu  Ser  Asp  Glu  Asp  Lys  Pro  Leu
1340                     1345                    1350

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Phe  Gly  Pro  Leu  Pro  Cys  Arg  Leu  Asp  Asp  Cys  Leu  Arg  Ser  Leu
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Thr  Arg  Phe  Ala  Ala  Ala  His  Trp  Thr  Val  Ala  Ser  Val  Ser  Val
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Val  Gln  Gly  His  Phe  Cys  Lys  Leu  Phe  Ala  Ser  Leu  Val  Pro  Asn
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Asp  Ser  His  Glu  Glu  Leu  Pro  Cys  Ile  Leu  Asp  Ile  Asp  Met  Phe
1400                     1405                    1410

cat  tta  ttg  gtg  ggc  ttg  gtg  ctt  gca  ttt  cct  gcg  ttg  cag  tgt        4581
His  Leu  Leu  Val  Gly  Leu  Val  Leu  Ala  Phe  Pro  Ala  Leu  Gln  Cys
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cag  gat  ttt  tca  ggg  atc  agc  ctt  ggc  act  gga  gac  ctt  cac  att        4626
Gln  Asp  Phe  Ser  Gly  Ile  Ser  Leu  Gly  Thr  Gly  Asp  Leu  His  Ile
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Phe  His  Leu  Val  Thr  Met  Ala  His  Ile  Ile  Gln  Ile  Leu  Leu  Thr.
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Ser  Cys  Thr  Glu  Glu  Asn  Gly  Met  Asp  Gln  Glu  Asn  Pro  Pro  Cys
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Glu  Glu  Glu  Ser  Ala  Val  Leu  Ala  Leu  Tyr  Lys  Thr  Leu  His  Gln
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Tyr  Thr  Gly  Ser  Ala  Leu  Lys  Glu  Ile  Pro  Ser  Gly  Trp  His  Leu
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Trp  Arg  Ser  Val  Arg  Ala  Gly  Ile  Met  Pro  Phe  Leu  Lys  Cys  Ser
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Ala  Leu  Phe  Phe  His  Tyr  Leu  Asn  Gly  Val  Pro  Ser  Pro  Pro  Asp
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att  caa  gtt  cct  gga  aca  agc  cat  ttt  gaa  cat  tta  tgt  agc  tat        4941
Ile  Gln  Val  Pro  Gly  Thr  Ser  His  Phe  Glu  His  Leu  Cys  Ser  Tyr
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ctt  tcc  cta  cca  aac  aac  ctc  att  tgc  ctt  ttt  caa  gaa  aat  agt        4986
Leu  Ser  Leu  Pro  Asn  Asn  Leu  Ile  Cys  Leu  Phe  Gln  Glu  Asn  Ser
1550                     1555                    1560
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Glu  Ile  Met  Asn  Ser  Leu  Ile  Glu  Ser  Trp  Cys  Arg  Asn  Ser  Glu
1565                1570                1575

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Val  Lys  Arg  Tyr  Leu  Glu  Gly  Glu  Arg  Asp  Ala  Ile  Arg  Tyr  Pro
1580                1585                1590

aga  gaa  tct  aac  aaa  tta  ata  aac  ctt  cca  gag  gat  tac  agc  agc      5121
Arg  Glu  Ser  Asn  Lys  Leu  Ile  Asn  Leu  Pro  Glu  Asp  Tyr  Ser  Ser
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Asp  Lys  Ser  Arg  Ala  Pro  Thr  Leu  Cys  Leu  Val  Cys  Gly  Ser  Leu
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Asp  Val  Gly  Ala  Cys  Thr  Ala  His  Thr  Tyr  Ser  Cys  Gly  Ser  Gly
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Val  Gly  Ile  Phe  Leu  Arg  Val  Arg  Glu  Cys  Gln  Val  Leu  Phe  Leu
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Ala  Gly  Lys  Thr  Lys  Gly  Cys  Phe  Tyr  Ser  Pro  Pro  Tyr  Leu  Asp
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1715                1720                1725

caa  cac  agt  gtc  aca  gag  gaa  att  gga  cat  gca  cag  gaa  gcc  aat      5526
Gln  His  Ser  Val  Thr  Glu  Glu  Ile  Gly  His  Ala  Gln  Glu  Ala  Asn
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cag  aca  ctg  gtt  ggc  att  gac  tgg  caa  cat  tta  taattattgc              5569
Gln  Thr  Leu  Val  Gly  Ile  Asp  Trp  Gln  His  Leu
1745                1750                1755

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attggatccc  agccccttg  tggggtctg  actgcatagt  cccagccatt  atgtgatatt      5869

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gaagcccgtg gggagaaggt ggattcctgg tgtgctggct ggttttcag ggctgttaga     6169

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<213>   Homo sapeins

<400>   4

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Leu Glu Cys Ser Ala Glu Glu Ile Ala Gly Lys Trp Leu Gln Ala Thr
                20                  25                  30

Asp Leu Thr Arg Glu Val Tyr Gln His Leu Ala His Tyr Val Pro Lys
            35                  40                  45

Ile Tyr Cys Arg Gly Pro Asn Pro Phe Pro Gln Lys Glu Asp Met Leu
        50                  55                  60

Ala Gln His Val Leu Leu Gly Pro Met Glu Trp Tyr Leu Cys Gly Glu
65                  70                  75                  80

Asp Pro Ala Phe Gly Phe Pro Lys Leu Glu Gln Ala Asn Lys Pro Ser
                85                  90                  95

His Leu Cys Gly Arg Val Phe Lys Val Gly Glu Pro Thr Tyr Ser Cys
            100                 105                 110

Arg Asp Cys Ala Val Asp Pro Thr Cys Val Leu Cys Met Glu Cys Phe
            115                 120                 125

Leu Gly Ser Ile His Arg Asp His Arg Tyr Arg Met Thr Thr Ser Gly
        130                 135                 140

Gly Gly Gly Phe Cys Asp Cys Gly Asp Thr Glu Ala Trp Lys Glu Gly
145                 150                 155                 160
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Pro Tyr Cys Gln Lys His Glu Leu Asn Thr Ser Glu Ile Glu Glu Glu
                 165             170             175

Glu Asp Pro Leu Val His Leu Ser Glu Asp Val Ile Ala Arg Thr Tyr
             180             185             190

Asn Ile Phe Ala Ile Thr Phe Arg Tyr Ala Val Glu Ile Leu Thr Trp
             195             200             205

Glu Lys Glu Ser Glu Leu Pro Ala Asp Leu Glu Met Val Glu Lys Ser
     210             215             220

Asp Thr Tyr Tyr Cys Met Leu Phe Asn Asp Glu Val His Thr Tyr Glu
225             230             235             240

Gln Val Ile Tyr Thr Leu Gln Lys Ala Val Asn Cys Thr Gln Lys Glu
             245             250             255

Ala Ile Gly Phe Ala Thr Thr Val Asp Arg Asp Gly Arg Arg Ser Val
             260             265             270

Arg Tyr Gly Asp Phe Gln Tyr Cys Glu Gln Ala Lys Ser Val Ile Val
     275             280             285

Arg Asn Thr Ser Arg Gln Thr Lys Pro Leu Lys Val Gln Val Met His
     290             295             300

Ser Ser Ile Val Ala His Gln Asn Phe Gly Leu Lys Leu Leu Ser Trp
305             310             315             320

Leu Gly Ser Ile Ile Gly Tyr Ser Asp Gly Leu Arg Arg Ile Leu Cys
             325             330             335

Gln Val Gly Leu Gln Glu Gly Pro Asp Gly Glu Asn Ser Ser Leu Val
             340             345             350

Asp Arg Leu Met Leu Ser Asp Ser Lys Leu Trp Lys Gly Ala Arg Ser
             355             360             365

Val Tyr His Gln Leu Phe Met Ser Ser Leu Leu Met Asp Leu Lys Tyr
370             375             380

Lys Lys Leu Phe Ala Val Arg Phe Ala Lys Asn Tyr Gln Gln Leu Gln
385             390             395             400

Arg Asp Phe Met Glu Asp Asp His Glu Arg Ala Val Ser Val Thr Ala
             405             410             415
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Leu Ser Val Gln Phe Phe Thr Ala Pro Thr Leu Ala Arg Met Leu Ile
            420                 425                 430

Thr Glu Glu Asn Leu Met Ser Ile Ile Ile Lys Thr Phe Met Asp His
            435                 440                 445

Leu Arg His Arg Asp Ala Gln Gly Arg Phe Gln Phe Glu Arg Tyr Thr
    450                 455                 460

Ala Leu Gln Ala Phe Lys Phe Arg Arg Val Gln Ser Leu Ile Leu Asp
465                 470                 475                 480

Leu Lys Tyr Val Leu Ile Ser Lys Pro Thr Glu Trp Ser Asp Glu Leu
            485                 490                 495

Arg Gln Lys Phe Leu Glu Gly Phe Asp Ala Phe Leu Glu Leu Leu Lys
            500                 505                 510

Cys Met Gln Gly Met Asp Pro Ile Thr Arg Gln Val Gly Gln His Ile
            515                 520                 525

Glu Met Glu Pro Glu Trp Glu Ala Ala Phe Thr Leu Gln Met Lys Leu
    530                 535                 540

Thr His Val Ile Ser Met Met Gln Asp Trp Cys Ala Ser Asp Glu Lys
545                 550                 555                 560

Val Leu Ile Glu Ala Tyr Lys Lys Cys Leu Ala Val Leu Met Gln Cys
                565                 570                 575

His Gly Gly Tyr Thr Asp Gly Glu Gln Pro Ile Thr Leu Ser Ile Cys
            580                 585                 590

Gly His Ser Val Glu Thr Ile Arg Tyr Cys Val Ser Gln Glu Lys Val
            595                 600                 605

Ser Ile His Leu Pro Val Ser Arg Leu Leu Ala Gly Leu His Val Leu
    610                 615                 620

Leu Ser Lys Ser Glu Val Ala Tyr Lys Phe Pro Glu Leu Leu Pro Leu
625                 630                 635                 640

Ser Glu Leu Ser Pro Pro Met Leu Ile Glu His Pro Leu Arg Cys Leu
            645                 650                 655

Val Leu Cys Ala Gln Val His Ala Gly Met Trp Arg Arg Asn Gly Phe
            660                 665                 670
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Ser Leu Val Asn Gln Ile Tyr Tyr Tyr His Asn Val Lys Cys Arg Arg
        675             680             685

Glu Met Phe Asp Lys Asp Val Val Met Leu Gln Thr Gly Val Ser Met
        690             695             700

Met Asp Pro Asn His Phe Leu Met Ile Met Leu Ser Arg Phe Glu Leu
705             710             715             720

Tyr Gln Ile Phe Ser Thr Pro Asp Tyr Gly Lys Arg Phe Ser Ser Glu
                725             730             735

Ile Thr His Lys Asp Val Val Gln Gln Asn Asn Thr Leu Ile Glu Glu
            740             745             750

Met Leu Tyr Leu Ile Ile Met Leu Val Gly Glu Arg Phe Ser Pro Gly
            755             760             765

Val Gly Gln Val Asn Ala Thr Asp Glu Ile Lys Arg Glu Ile Ile His
    770             775             780

Gln Leu Ser Ile Lys Pro Met Ala His Ser Glu Leu Val Lys Ser Leu
785             790             795             800

Pro Glu Asp Glu Asn Lys Glu Thr Gly Met Glu Ser Val Ile Glu Ala
            805             810             815

Val Ala His Phe Lys Lys Pro Gly Leu Thr Gly Arg Gly Met Tyr Glu
            820             825             830

Leu Lys Pro Glu Cys Ala Lys Glu Phe Asn Leu Tyr Phe Tyr His Phe
        835             840             845

Ser Arg Ala Glu Gln Ser Lys Ala Glu Glu Ala Gln Arg Lys Leu Lys
    850             855             860

Arg Gln Asn Arg Glu Asp Thr Ala Leu Pro Pro Pro Val Leu Pro Pro
865             870             875             880

Phe Cys Pro Leu Phe Ala Ser Leu Val Asn Ile Leu Gln Ser Asp Val
            885             890             895

Met Leu Cys Ile Met Gly Thr Ile Leu Gln Trp Ala Val Glu His Asn
            900             905             910

Gly Tyr Ala Trp Ser Glu Ser Met Leu Gln Arg Val Leu His Leu Ile
        915             920             925
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Gly Met Ala Leu Gln Glu Glu Lys Gln His Leu Glu Asn Val Thr Glu
    930                 935                 940

Glu His Val Val Thr Phe Thr Phe Thr Gln Lys Ile Ser Lys Pro Gly
945                 950                 955                 960

Glu Ala Pro Lys Asn Ser Pro Ser Ile Leu Ala Met Leu Glu Thr Leu
                965                 970                 975

Gln Asn Ala Pro Tyr Leu Glu Val His Lys Asp Met Ile Arg Trp Ile
                980                 985                 990

Leu Lys Thr Phe Asn Ala Val Lys  Lys Met Arg Glu Ser  Ser Pro Thr
        995                 1000                1005

Ser Pro  Val Ala Glu Thr Glu  Gly Thr Ile Met Glu  Glu Ser Ser
    1010                1015                1020

Arg Asp  Lys Asp Lys Ala Glu  Arg Lys Arg Lys Ala  Glu Ile Ala
    1025                1030                1035

Arg Leu  Arg Arg Glu Lys Ile  Met Ala Gln Met Ser  Glu Met Gln
    1040                1045                1050

Arg His  Phe Ile Asp Glu Asn  Lys Glu Leu Phe Gln  Gln Thr Leu
    1055                1060                1065

Glu Leu  Asp Ala Ser Thr Ser  Ala Val Leu Asp His  Ser Pro Val
    1070                1075                1080

Ala Ser  Asp Met Thr Leu Thr  Ala Leu Gly Pro Thr  Gln Thr Gln
    1085                1090                1095

Val Pro  Glu Gln Arg Gln Phe  Val Thr Cys Ile Leu  Cys Gln Glu
    1100                1105                1110

Glu Gln  Glu Val Lys Val Glu  Ser Arg Ala Met Val  Leu Ala Ala
    1115                1120                1125

Phe Val  Gln Arg Ser Thr Val  Leu Ser Lys Asn Arg  Ser Lys Phe
    1130                1135                1140

Ile Gln  Asp Pro Glu Lys Tyr  Asp Pro Leu Phe Met  His Pro Asp
    1145                1150                1155

Leu Ser  Cys Gly Thr His Thr  Ser Ser Cys Gly His  Ile Met His
    1160                1165                1170
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Ala His Cys Trp Gln Arg Tyr   Phe Asp Ser Val Gln   Ala Lys Glu
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Gln. Arg Arg Gln Gln Arg Leu   Arg Leu His Thr Ser   Tyr Asp Val
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Glu Asn Gly Glu Phe Leu Cys   Pro Leu Cys Glu Cys   Leu Ser Asn
    1205   1210   1215

Thr Val Ile Pro Leu Leu Leu   Pro Pro Arg Asn Ile   Phe Asn Asn
    1220   1225   1230

Arg Leu Asn Phe Ser Asp Gln   Pro Asn Leu Thr Gln   Trp Ile Arg
    1235   1240   1245

Thr Ile Ser Gln Gln Ile Lys   Ala Leu Gln Phe Leu   Arg Lys Glu
    1250   1255   1260

Glu Ser Thr Pro Asn Asn Ala   Ser Thr Lys Asn Ser   Glu Asn Val
    1265   1270   1275

Asp Glu Leu Gln Leu Pro Glu   Gly Phe Arg Pro Asp   Phe Arg Pro
    1280   1285   1290

Lys Ile Pro Tyr Ser Glu Ser   Ile Lys Glu Met Leu   Thr Thr Phe
    1295   1300   1305

Gly Thr Ala Thr Tyr Lys Val   Gly Leu Lys Val His   Pro Asn Glu
    1310   1315   1320

Glu Asp Pro Arg Val Pro Ile   Met Cys Trp Gly Ser   Cys Ala Tyr
    1325   1330   1335

Thr Ile Gln Ser Ile Glu Arg   Ile Leu Ser Asp Glu   Asp Lys Pro
    1340   1345   1350

Leu Phe Gly Pro Leu Pro Cys   Arg Leu Asp Asp Cys   Leu Arg Ser
    1355   1360   1365

Leu Thr Arg Phe Ala Ala Ala   His Trp Thr Val Ala   Ser Val Ser
    1370   1375   1380

Val Val Gln Gly His Phe Cys   Lys Leu Phe Ala Ser   Leu Val Pro
    1385   1390   1395

Asn Asp Ser His Glu Glu Leu   Pro Cys Ile Leu Asp   Ile Asp Met
    1400   1405   1410

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Phe His Leu Leu Val Gly Leu   Val Leu Ala Phe Pro   Ala Leu Gln
    1415            1420                1425

Cys Gln Asp Phe Ser Gly Ile   Ser Leu Gly Thr Gly   Asp Leu His
    1430            1435                1440

Ile Phe His Leu Val Thr Met   Ala His Ile Ile Gln   Ile Leu Leu
    1445            1450                1455

Thr Ser Cys Thr Glu Glu Asn   Gly Met Asp Gln Glu   Asn Pro Pro
    1460            1465                1470

Cys Glu Glu Glu Ser Ala Val   Leu Ala Leu Tyr Lys   Thr Leu His
    1475            1480                1485

Gln Tyr Thr Gly Ser Ala Leu   Lys Glu Ile Pro Ser   Gly Trp His
    1490            1495                1500

Leu Trp Arg Ser Val Arg Ala   Gly Ile Met Pro Phe   Leu Lys Cys
    1505            1510                1515

Ser Ala Leu Phe Phe His Tyr   Leu Asn Gly Val Pro   Ser Pro Pro
    1520            1525                1530

Asp Ile Gln Val Pro Gly Thr   Ser His Phe Glu His   Leu Cys Ser
    1535            1540                1545

Tyr Leu Ser Leu Pro Asn Asn   Leu Ile Cys Leu Phe   Gln Glu Asn
    1550            1555                1560

Ser Glu Ile Met Asn Ser Leu   Ile Glu Ser Trp Cys   Arg Asn Ser
    1565            1570                1575

Glu Val Lys Arg Tyr Leu Glu   Gly Glu Arg Asp Ala   Ile Arg Tyr
    1580            1585                1590

Pro Arg Glu Ser Asn Lys Leu   Ile Asn Leu Pro Glu   Asp Tyr Ser
    1595            1600                1605

Ser Leu Ile Asn Gln Ala Ser   Asn Phe Ser Cys Pro   Lys Ser Gly
    1610            1615                1620

Gly Asp Lys Ser Arg Ala Pro   Thr Leu Cys Leu Val   Cys Gly Ser
    1625            1630                1635

Leu Leu Cys Ser Gln Ser Tyr   Cys Cys Gln Thr Glu   Leu Glu Gly
    1640            1645                1650
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Glu Asp  Val Gly Ala Cys Thr  Ala His Thr Tyr Ser  Cys Gly Ser
    1655             1660             1665

Gly Val  Gly Ile Phe Leu Arg  Val Arg Glu Cys Gln  Val Leu Phe
    1670             1675             1680

Leu Ala  Gly Lys Thr Lys Gly  Cys Phe Tyr Ser Pro  Pro Tyr Leu
    1685             1690             1695

Asp Asp  Tyr Gly Glu Thr Asp  Gln Gly Leu Arg Arg  Gly Asn Pro
    1700             1705             1710

Leu His  Leu Cys Lys Glu Arg  Phe Lys Lys Ile Gln  Lys Leu Trp
    1715             1720             1725

His Gln  His Ser Val Thr Glu  Glu Ile Gly His Ala  Gln Glu Ala
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Asn Gln  Thr Leu Val Gly Ile  Asp Trp Gln His Leu
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cggtttgact cacggggatt tccaagtctc caccccattg acgtcaatgg gagtttgttt       240
tggcaccaaa atcaacggga ctttccaaaa tgtcgtaaca actccgcccc attgacgcaa       300
atgggcggta ggcgtgtacg gtgggaggtc tatataagca gagctctctg gctaactaga       360
gaacccactg cttactggct tatcgaaatt aatacgactc actataggga cccaagct        420
tggtaccgag ctcggatcca ctactcgacc cacgcgtccg cggtagtggc tgtccggagt       480
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ccgctttgct cctcgcgcat ctcggctcgg cggcagcccg acggcccgg gactgacggc        660
cccaggacag gggtgaccgt cgcggctgcg ggagcagagg cgaagctgag gcccgggggag      720
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aggcgacagc ggcgagagca cccgggggaga ggaggaggag agaag atg gcg tcg gag        777
                                                      Met Ala Ser Glu
                                                        1

atg gag ccc gag gtg cag gcc atc gac cgc agt ttg ctg gaa tgt tct        825
Met Glu Pro Glu Val Gln Ala Ile Asp Arg Ser Leu Leu Glu Cys Ser
 5                      10              15                  20

gcc gaa gag atc gca ggg aga tgg ctg caa gca acc gac ctc aac aga        873
Ala Glu Glu Ile Ala Gly Arg Trp Leu Gln Ala Thr Asp Leu Asn Arg
                     25              30                  35

gaa gtg tac cag cat tta gcc cac tgt gtg ccc aaa atc tac tgc cgg        921
Glu Val Tyr Gln His Leu Ala His Cys Val Pro Lys Ile Tyr Cys Arg
                 40              45                  50

ggc cct aac ccc ttc cct cag aag gaa gac acg ctg gca cag cac atc        969
Gly Pro Asn Pro Phe Pro Gln Lys Glu Asp Thr Leu Ala Gln His Ile
             55              60                  65

ctg ctg gga ccg atg gag tgg tac atc tgc gct gaa gac cct gcg ctg       1017
Leu Leu Gly Pro Met Glu Trp Tyr Ile Cys Ala Glu Asp Pro Ala Leu
         70              75                  80

gga ttt cca aag ctc gag cag gca aac aag cct tct cac ctc tgt ggc       1065
Gly Phe Pro Lys Leu Glu Gln Ala Asn Lys Pro Ser His Leu Cys Gly
85                      90              95                 100

cga gtg ttt aaa gtg ggg gaa cct aca tac tcc tgc aga gac tgt gca       1113
Arg Val Phe Lys Val Gly Glu Pro Thr Tyr Ser Cys Arg Asp Cys Ala
                 105             110                 115

gtt gac ccc acc tgt gtt tta tgc atg gag tgc ttc ctg gga agt atc       1161
Val Asp Pro Thr Cys Val Leu Cys Met Glu Cys Phe Leu Gly Ser Ile
             120             125                 130

cat aga gac cat cga tat agg atg acc aca tcg gga gga ggg ggc ttc       1209
His Arg Asp His Arg Tyr Arg Met Thr Thr Ser Gly Gly Gly Gly Phe
             135             140                 145

tgt gac tgt ggt gac act gag gcg tgg aaa gag gga cct tac tgc cag       1257
Cys Asp Cys Gly Asp Thr Glu Ala Trp Lys Glu Gly Pro Tyr Cys Gln
         150             155                 160

aag cac aag ctc agc agc tct gaa gtt gtg gag gag gag gat cct ctt       1305
Lys His Lys Leu Ser Ser Ser Glu Val Val Glu Glu Glu Asp Pro Leu
165                 170             175                 180

gtg cat cta tca gaa gat gtg atc gcc aga act tac aac att ttt gct       1353
Val His Leu Ser Glu Asp Val Ile Ala Arg Thr Tyr Asn Ile Phe Ala
             185                 190             195

att atg ttt cga tat gca gta gat ata ctg acc tgg gaa aaa gaa agt       1401
Ile Met Phe Arg Tyr Ala Val Asp Ile Leu Thr Trp Glu Lys Glu Ser
             200                 205             210

gaa ttg cct gaa gac tta gaa gtg gca gag aag agt gac acc tac tac       1449
Glu Leu Pro Glu Asp Leu Glu Val Ala Glu Lys Ser Asp Thr Tyr Tyr
             215             220                 225

tgc atg ctg ttt aat gat gag gtt cac acc tat gag caa gtc att tat       1497
Cys Met Leu Phe Asn Asp Glu Val His Thr Tyr Glu Gln Val Ile Tyr
             230             235                 240
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acc ctt cag aaa gct gtg aac tgt aca cag aag gaa gcc att ggc ttt    1545
Thr Leu Gln Lys Ala Val Asn Cys Thr Gln Lys Glu Ala Ile Gly Phe
245                 250                 255                 260

gca act aca gtt gat cga gat ggc cgt agg cct gtc cga tat gga gat    1593
Ala Thr Thr Val Asp Arg Asp Gly Arg Arg Pro Val Arg Tyr Gly Asp
                265                 270                 275

ttc cag tac tgt gat caa gca aag aca gtc att gtg agg aac acc agc    1641
Phe Gln Tyr Cys Asp Gln Ala Lys Thr Val Ile Val Arg Asn Thr Ser
                280                 285                 290

aga cag acc aag ccg ctc aaa gtt caa gtt atg cac tcc tcc gtg gct    1689
Arg Gln Thr Lys Pro Leu Lys Val Gln Val Met His Ser Ser Val Ala
                295                 300                 305

gct cat cag aat ttt ggt ttg aaa gct ctg tcg tgg ctg gga agt gtt    1737
Ala His Gln Asn Phe Gly Leu Lys Ala Leu Ser Trp Leu Gly Ser Val
                310                 315                 320

att gga tac tca gat ggc ctt cgc agg att ttg tgt caa gtt gga tta    1785
Ile Gly Tyr Ser Asp Gly Leu Arg Arg Ile Leu Cys Gln Val Gly Leu
325                 330                 335                 340

caa gaa ggt cca gat ggc gaa aac tct tct ctg gtc gac aga ctg atg    1833
Gln Glu Gly Pro Asp Gly Glu Asn Ser Ser Leu Val Asp Arg Leu Met
                345                 350                 355

ctt aat gat tcc aaa tta tgg aaa ggg gct agg agt gtg tat cac cag    1881
Leu Asn Asp Ser Lys Leu Trp Lys Gly Ala Arg Ser Val Tyr His Gln
                360                 365                 370

ttg ttc atg agc agc ctg ctc atg gac ctc aag tat aag aag ctg ttc    1929
Leu Phe Met Ser Ser Leu Leu Met Asp Leu Lys Tyr Lys Lys Leu Phe
                375                 380                 385

gcg ctt cga ttt gct aaa aat tac cgg cag ttg cag agg gat ttt atg    1977
Ala Leu Arg Phe Ala Lys Asn Tyr Arg Gln Leu Gln Arg Asp Phe Met
                390                 395                 400

gag gat gat cac gag cgg gca gtg tcg gtg act gct ctg tct gtc cag    2025
Glu Asp Asp His Glu Arg Ala Val Ser Val Thr Ala Leu Ser Val Gln
405                 410                 415                 420

ttc ttc acc gca ccg acg ctg gcg cga atg ctc ctc aca gaa gag aac    2073
Phe Phe Thr Ala Pro Thr Leu Ala Arg Met Leu Leu Thr Glu Glu Asn
                425                 430                 435

ctg atg acc gtt atc att aag gct ttc atg gac cat ttg aaa cac aga    2121
Leu Met Thr Val Ile Ile Lys Ala Phe Met Asp His Leu Lys His Arg
                440                 445                 450

gat gcc cag ggc aga ttc cag ttt gaa cgc tac act gcc ctc caa gcc    2169
Asp Ala Gln Gly Arg Phe Gln Phe Glu Arg Tyr Thr Ala Leu Gln Ala
                455                 460                 465

ttc aag ttc agg aga gtc cag agc ctc atc tta gat ctc aag tat gta    2217
Phe Lys Phe Arg Arg Val Gln Ser Leu Ile Leu Asp Leu Lys Tyr Val
                470                 475                 480

ttg att agc aaa cca acg gag tgg tca gat gag ctg agg cag aag ttc    2265
Leu Ile Ser Lys Pro Thr Glu Trp Ser Asp Glu Leu Arg Gln Lys Phe
485                 490                 495                 500
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tta caa ggg ttc gat gcc ttc ttg gaa tta ctg aag tgc atg cag gga    2313
Leu Gln Gly Phe Asp Ala Phe Leu Glu Leu Leu Lys Cys Met Gln Gly
            505                 510                 515

atg gac ccg atc acg cgt cag gtg gga cag cac att gag atg gag cca    2361
Met Asp Pro Ile Thr Arg Gln Val Gly Gln His Ile Glu Met Glu Pro
            520                 525                 530

gag tgg gaa gca gcc ttc aca ctg cag atg aag ctg aca cac gtc atc    2409
Glu Trp Glu Ala Ala Phe Thr Leu Gln Met Lys Leu Thr His Val Ile
            535                 540                 545

tca atg gtg cag gac tgg tgt gct ctg gac gaa aaa gtg tta att gaa    2457
Ser Met Val Gln Asp Trp Cys Ala Leu Asp Glu Lys Val Leu Ile Glu
            550                 555                 560

gct tac aag aaa tgc ctg gct gtg ctg aca cag tgt cat ggc gga ttt   ·2505
Ala Tyr Lys Lys Cys Leu Ala Val Leu Thr Gln Cys His Gly Gly Phe
565                 570                 575                 580

act gat ggt gaa cag cca atc aca ctc agt att tgt gga cac tcg gtg    2553
Thr Asp Gly Glu Gln Pro Ile Thr Leu Ser Ile Cys Gly His Ser Val
            585                 590                 595

gaa acc atc aga tac tgt gtt tcc caa gaa aaa gtt agc att cac ctc    2601
Glu Thr Ile Arg Tyr Cys Val Ser Gln Glu Lys Val Ser Ile His Leu
            600                 605                 610

cca att tct cgc ttg ctt gca ggt ttg cat gta ttg tta agc aaa agt    2649
Pro Ile Ser Arg Leu Leu Ala Gly Leu His Val Leu Leu Ser Lys Ser
            615                 620                 625

gaa gtg gca tat aaa ttt cca gag ctc cta cct cta agt gaa ctg agc   ·2697
Glu Val Ala Tyr Lys Phe Pro Glu Leu Leu Pro Leu Ser Glu Leu Ser
            630                 635                 640

cca ccc atg ttg ata gaa cat cct ctt aga tgt ctt gtc tta tgt gct    2745
Pro Pro Met Leu Ile Glu His Pro Leu Arg Cys Leu Val Leu Cys Ala
645                 650                 655                 660

caa gtg cat gct ggg atg tgg aga aga aat ggc ttc tct cta gta aat    2793
Gln Val His Ala Gly Met Trp Arg Arg Asn Gly Phe Ser Leu Val Asn
            665                 670                 675

cag atc tat tac tac cat aat gtg aaa tgc agg cga gag atg ttc gac    2841
Gln Ile Tyr Tyr Tyr His Asn Val Lys Cys Arg Arg Glu Met Phe Asp
            680                 685                 690

aag gac ata gtg atg ctt cag aca ggt gtc tcc atg atg gac cca aac    2889
Lys Asp Ile Val Met Leu Gln Thr Gly Val Ser Met Met Asp Pro Asn
            695                 700                 705

cac ttc ctg atg atc atg ctc agc cgc ttt gaa ctc tat cag ctc ttc    2937
His Phe Leu Met Ile Met Leu Ser Arg Phe Glu Leu Tyr Gln Leu Phe
            710                 715                 720

agc acg cct gac tat ggg aag aga ttc agt tct gag gtt acc cat aag    2985
Ser Thr Pro Asp Tyr Gly Lys Arg Phe Ser Ser Glu Val Thr His Lys
725                 730                 735                 740

gac gtc gtt cag cag aac aac act ctg atc gaa gag atg ctc tac ctc    3033
Asp Val Val Gln Gln Asn Asn Thr Leu Ile Glu Glu Met Leu Tyr Leu
            745                 750                 755
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atc atc atg ctt gtg gga gaa aga ttc aac cct ggg gtt gga cag gtg     3081
Ile Ile Met Leu Val Gly Glu Arg Phe Asn Pro Gly Val Gly Gln Val
            760                 765                 770

gct gcc aca gat gaa atc aag agg gag att atc cat cag ttg agc atc     3129
Ala Ala Thr Asp Glu Ile Lys Arg Glu Ile Ile His Gln Leu Ser Ile
            775.                780                 785

aag cct atg gct cac agt gag ctg gtg aag tct ctg cct gaa gat gag     3177
Lys Pro Met Ala His Ser Glu Leu Val Lys Ser Leu Pro Glu Asp Glu
        790                 795                 800

aac aag gag acc ggc atg gag agc gtc atc gag tcc gtt gca cat ttc     3225
Asn Lys Glu Thr Gly Met Glu Ser Val Ile Glu Ser Val Ala His Phe
805                 810                 815                 820

aag aaa cct ggg ctc aca ggg cga ggc atg tat gag ctg aag cca gag     3273
Lys Lys Pro Gly Leu Thr Gly Arg Gly Met Tyr Glu Leu Lys Pro Glu
                825                 830                 835

tgt gcc aaa gag ttc aac ctg tat ttt tat cat ttc tcc agg gca gag     3321
Cys Ala Lys Glu Phe Asn Leu Tyr Phe Tyr His Phe Ser Arg Ala Glu
            840                 845                 850

cag tcc aag gca gag gaa gct cag cgg aaa ttg aaa aga gaa aat aaa     3369
Gln Ser Lys Ala Glu Glu Ala Gln Arg Lys Leu Lys Arg Glu Asn Lys
            855                 860                 865

gaa gat aca gca ctc cct cct ccg gct ttg cca ccg ttc tgc cct ttg     3417
Glu Asp Thr Ala Leu Pro Pro Pro Ala Leu Pro Pro Phe Cys Pro Leu
        870                 875                 880

ttc gcg agt ctg gtt aac atc ttg cag tgt gac gtc atg ctg tac atc     3465
Phe Ala Ser Leu Val Asn Ile Leu Gln Cys Asp Val Met Leu Tyr Ile
885                 890                 895                 900

atg gga acg atc ctg cag tgg gct gta gag cat cac ggg tct gcc tgg     3513
Met Gly Thr Ile Leu Gln Trp Ala Val Glu His His Gly Ser Ala Trp
                905                 910                 915

tca gag tcc atg cta cag agg gtg ctg cat ttg atc ggg atg gct ctc     3561
Ser Glu Ser Met Leu Gln Arg Val Leu His Leu Ile Gly Met Ala Leu
            920                 925                 930

cag gaa gag aag cac cac ttg gag aac gcc gtg gaa ggg cac gtg cag     3609
Gln Glu Glu Lys His His Leu Glu Asn Ala Val Glu Gly His Val Gln
            935                 940                 945

acc ttc acc ttc aca cag aag att tca aag cct ggt gat gca cca cat     3657
Thr Phe Thr Phe Thr Gln Lys Ile Ser Lys Pro Gly Asp Ala Pro His
        950                 955                 960

aac tcc ccg agc atc cta gct atg ctg gag acc ttg cag aac gcc ccc     3705
Asn Ser Pro Ser Ile Leu Ala Met Leu Glu Thr Leu Gln Asn Ala Pro
965                 970                 975                 980

tcc ctg gaa gcc cac aag gac atg atc agg tgg ttg cta aag atg ttt     3753
Ser Leu Glu Ala His Lys Asp Met Ile Arg Trp Leu Leu Lys Met Phe
            985                 990                 995

aat gca att aag  aag ata aga gag tgt  tca tcc agc agc cct  gtg     3798
Asn Ala Ile Lys  Lys Ile Arg Glu Cys  Ser Ser Ser Ser Pro  Val
            1000                1005                1010
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gcc gag gcg gag   gga acc ata atg gag   gag agc tca aga gac   aag      3843
Ala Glu Ala Glu   Gly Thr Ile Met Glu   Glu Ser Ser Arg Asp   Lys
            1015                 1020                 1025

gac aaa gca gag   agg aaa aga aaa gcc   gag atc gcc aga ctg   cgc      3888
Asp Lys Ala Glu   Arg Lys Arg Lys Ala   Glu Ile Ala Arg Leu   Arg
            1030                 1035                 1040

cgg gag aag atc   atg gcc cag atg tct   gag atg cag cgg cac   ttc      3933
Arg Glu Lys Ile   Met Ala Gln Met Ser   Glu Met Gln Arg His   Phe
            1045                 1050                 1055

att gac gaa aac   aaa gag ctc ttc cag   cag acc cta gag ctg   gac      3978
Ile Asp Glu Asn   Lys Glu Leu Phe Gln   Gln Thr Leu Glu Leu   Asp
            1060                 1065                 1070

acc tct gcc tct   gcc act ctt gac agc   agc cct ccc gtt tca   gac      4023
Thr Ser Ala Ser   Ala Thr Leu Asp Ser   Ser Pro Pro Val Ser   Asp
            1075                 1080                 1085

gca gct ctt aca   gca ctg ggc cca gca   cag aca cag gtc cct   gaa      4068
Ala Ala Leu Thr   Ala Leu Gly Pro Ala   Gln Thr Gln Val Pro   Glu
            1090                 1095                 1100

ccg aga cag ttt   gtc acc tgt ata tta   tgt caa gag gag caa   gag      4113
Pro Arg Gln Phe   Val Thr Cys Ile Leu   Cys Gln Glu Glu Gln   Glu
            1105                 1110                 1115

gtg act gtg gga   agc agg gcg atg gtc   ttg gca gcg ttt gtt   cag      4158
Val Thr Val Gly   Ser Arg Ala Met Val   Leu Ala Ala Phe Val   Gln
            1120                 1125                 1130

agg tca acg gtt   ctg tca aaa gac agg   acg aaa acc atc gcg   gac      4203
Arg Ser Thr Val   Leu Ser Lys Asp Arg   Thr Lys Thr Ile Ala   Asp
            1135                 1140                 1145

cca gaa aaa tat   gat cca tta ttc atg   cac ccc gat ctg tct   tgt      4248
Pro Glu Lys Tyr   Asp Pro Leu Phe Met   His Pro Asp Leu Ser   Cys
            1150                 1155                 1160

ggg aca cac act   ggc agc tgt ggg cac   gtt atg cat gcc cat   tgt      4293
Gly Thr His Thr   Gly Ser Cys Gly His   Val Met His Ala His   Cys
            1165                 1170                 1175

tgg caa agg tat   ttt gat tcc gtt caa   gcc aag gag cag cga   agg      4338
Trp Gln Arg Tyr   Phe Asp Ser Val Gln   Ala Lys Glu Gln Arg   Arg
            1180                 1185                 1190

cag cag cgg ctg   cgc ttg cac act agc   tac gat gta gag aat   ggc      4383
Gln Gln Arg Leu   Arg Leu His Thr Ser   Tyr Asp Val Glu Asn   Gly
            1195                 1200                 1205

gag ttc ctc tgc   ccg ctc tgt gag tgc   ctg agc aac acg gtg   atc      4428
Glu Phe Leu Cys   Pro Leu Cys Glu Cys   Leu Ser Asn Thr Val   Ile
            1210                 1215                 1220

ccc ctg ctg ctt   cct ccc agg agc atc   ctc agc agg agg tta   aat      4473
Pro Leu Leu Leu   Pro Pro Arg Ser Ile   Leu Ser Arg Arg Leu   Asn
            1225                 1230                 1235

ttt tca gac caa   cca gat ctg gca cag   tgg acg aga gca gta   aca      4518
Phe Ser Asp Gln   Pro Asp Leu Ala Gln   Trp Thr Arg Ala Val   Thr
            1240                 1245                 1250
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cag cag ata aag  gtg gtc cag atg ctg  agg aga aag cac aat  gct      4563
Gln Gln Ile Lys  Val Val Gln Met Leu  Arg Arg Lys His Asn  Ala
            1255              1260                   1265

gct gac acg tct  tct tca gag gac aca  gaa gcc atg aat ata  ata      4608
Ala Asp Thr Ser  Ser Ser Glu Asp Thr  Glu Ala Met Asn Ile  Ile
            1270              1275                   1280

ccg atc ccc gaa  ggc ttc agg cct gat  ttt tat cct agg aac  cca      4653
Pro Ile Pro Glu  Gly Phe Arg Pro Asp  Phe Tyr Pro Arg Asn  Pro
            1285              1290                   1295

tat tct gat agc  ata aaa gaa atg tta  acg aca ttt gga acg  gct      4698
Tyr Ser Asp Ser  Ile Lys Glu Met Leu  Thr Thr Phe Gly Thr  Ala
            1300              1305                   1310

gct tac aag gtg  gga ctg aag gtt cat  cct aat gaa ggt gac  ccc      4743
Ala Tyr Lys Val  Gly Leu Lys Val His  Pro Asn Glu Gly Asp  Pro
            1315              1320                   1325

cgt gtg ccc atc  ctg tgc tgg ggg acc  tgt gca tac acc atc  cag      4788
Arg Val Pro Ile  Leu Cys Trp Gly Thr  Cys Ala Tyr Thr Ile  Gln
            1330              1335                   1340

agc ata gaa aga  att ttg agt gat gag  gag aag cct gtt ttt  gga      4833
Ser Ile Glu Arg  Ile Leu Ser Asp Glu  Glu Lys Pro Val Phe  Gly
            1345              1350                   1355

cct ctg cct tgt  aga ctg gac gac tgt  ctc agg tcg tta aca  cgg      4878
Pro Leu Pro Cys  Arg Leu Asp Asp Cys  Leu Arg Ser Leu Thr  Arg
            1360              1365                   1370

ttt gca gca gca  cat tgg aca gtg gcg  tta ctt cct gtg gta  caa      4923
Phe Ala Ala Ala  His Trp Thr Val Ala  Leu Leu Pro Val Val  Gln
            1375              1380                   1385

gga cac ttc tgt  aaa ctc ttt gca tcc  ttg gtg cct agt gac  agc      4968
Gly His Phe Cys  Lys Leu Phe Ala Ser  Leu Val Pro Ser Asp  Ser
            1390              1395                   1400

tat gaa gac ctc  ccg tgc ata cta gac  atc gac atg ttt cac  ttg      5013
Tyr Glu Asp Leu  Pro Cys Ile Leu Asp  Ile Asp Met Phe His  Leu
            1405              1410                   1415

ctg gtg ggc ctg  gtg ctc gct ttc cca  gct ctg cag tgt cag  gat      5058
Leu Val Gly Leu  Val Leu Ala Phe Pro  Ala Leu Gln Cys Gln  Asp
            1420              1425                   1430

ttt tca gga agc  agc ctg gcc act ggg  gac ctg cac atc ttc  cac      5103
Phe Ser Gly Ser  Ser Leu Ala Thr Gly  Asp Leu His Ile Phe  His
            1435              1440                   1445

ttg gtt acc atg  gca cac atc gta cag  atc tta ctt acc tca  tgt      5148
Leu Val Thr Met  Ala His Ile Val Gln  Ile Leu Leu Thr Ser  Cys
            1450              1455                   1460

aca gaa gag aat  ggc atg gat caa gag  aat ccc act ggg gaa  gaa      5193
Thr Glu Glu Asn  Gly Met Asp Gln Glu  Asn Pro Thr Gly Glu  Glu
            1465              1470                   1475

gaa ctg gcc att  ctc tct ttg cac aaa  aca ctt cac cag tat  act      5238
Glu Leu Ala Ile  Leu Ser Leu His Lys  Thr Leu His Gln Tyr  Thr
            1480              1485                   1490
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gga agt gcc ttg   aaa gaa gcc ccc tcc   ggc tgg cac ctg tgg   agg        5283
Gly Ser Ala Leu   Lys Glu Ala Pro Ser   Gly Trp His Leu Trp   Arg
            1495              1500                 1505

agc gtc cgg gcc   gcc atc atg cct ttc   ctc aag tgc tct gct   ttg        5328
Ser Val Arg Ala   Ala Ile Met Pro Phe   Leu Lys Cys Ser Ala   Leu
            1510              1515                 1520

ttt ttc cac tat   tta aat gga gtc ccg   gcc cct cca gac ctt   caa        5373
Phe Phe His Tyr   Leu Asn Gly Val Pro   Ala Pro Pro Asp Leu   Gln
            1525              1530                 1535

gtt tct gga aca   agc cat ttt gaa cac   tta tgt aac tac ctt   tcc        5418
Val Ser Gly Thr   Ser His Phe Glu His   Leu Cys Asn Tyr Leu   Ser
            1540              1545                 1550

cta cca acc aac   ctc att cac ctt ttt   caa gaa aac agt gac   atc        5463
Leu Pro Thr Asn   Leu Ile His Leu Phe   Gln Glu Asn Ser Asp   Ile
            1555              1560                 1565

atg aac tcc ctg   att gaa agt tgg tgc   cag aac agt gaa gtt   aaa        5508
Met Asn Ser Leu   Ile Glu Ser Trp Cys   Gln Asn Ser Glu Val   Lys
            1570              1575                 1580

cgg tat cta aat   ggc gag aga gga gcg   ata agc tac ccc aga   gga        5553
Arg Tyr Leu Asn   Gly Glu Arg Gly Ala   Ile Ser Tyr Pro Arg   Gly
            1585              1590                 1595

gct aac aaa ctg   ata gac ctt cca gag   gat tac agc agc ctc   att        5598
Ala Asn Lys Leu   Ile Asp Leu Pro Glu   Asp Tyr Ser Ser Leu   Ile
            1600              1605                 1610

aac caa gca tcc   aat ttc tcg tgc ccc   aaa tca ggt ggc gac   aag        5643
Asn Gln Ala Ser   Asn Phe Ser Cys Pro   Lys Ser Gly Gly Asp   Lys
            1615              1620                 1625

agc aga gct cct   act ctg tgc ctc gtg   tgt ggg agt ctc ctc   tgc        5688
Ser Arg Ala Pro   Thr Leu Cys Leu Val   Cys Gly Ser Leu Leu   Cys
            1630              1635                 1640

tct cag agt tac   tgc tgc caa gct gag   ctg gag ggt gag gac   gtc        5733
Ser Gln Ser Tyr   Cys Cys Gln Ala Glu   Leu Glu Gly Glu Asp   Val
            1645              1650                 1655

gga gcc tgc aca   gca cac acc tac tcc   tgc ggc tcc ggg gcc   ggc        5778
Gly Ala Cys Thr   Ala His Thr Tyr Ser   Cys Gly Ser Gly Ala   Gly
            1660              1665                 1670

atc ttc ctg aga   gtg cgg gaa tgt cag   gtg cta ttt tta gct   ggc        5823
Ile Phe Leu Arg   Val Arg Glu Cys Gln   Val Leu Phe Leu Ala   Gly
            1675              1680                 1685

aaa acc aaa gga   tgt ttt tat tct cct   cct tac ctt gac gac   tat        5868
Lys Thr Lys Gly   Cys Phe Tyr Ser Pro   Pro Tyr Leu Asp Asp   Tyr
            1690              1695                 1700

gga gag acc gac   cag gga ctc aga cga   gga aat cct tta cat   tta        5913
Gly Glu Thr Asp   Gln Gly Leu Arg Arg   Gly Asn Pro Leu His   Leu
            1705              1710                 1715

tgc caa gag cgg   ttt cga aag atc cag   aag ctc tgg cag cag   cat        5958
Cys Gln Glu Arg   Phe Arg Lys Ile Gln   Lys Leu Trp Gln Gln   His
            1720              1725                 1730
```

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```
agt atc aca gag  gag atc gga cac gcg  cag gag gct aac cag  acc        6003
Ser Ile Thr Glu  Glu Ile Gly His Ala  Gln Glu Ala Asn Gln  Thr
             1735              1740                  1745

ctg gtc gga att  gac tgg cag cat tta  taatcgctcc tctactaaaa           6050
Leu Val Gly Ile  Asp Trp Gln His Leu
             1750              1755

acttgacttg gagttttgta acacagctgg cttttccag                            6089
```

<210> 6
<211> 1755
<212> PRT
<213> Mus musculus

<400> 6

```
Met Ala Ser Glu Met Glu Pro Glu Val Gln Ala Ile Asp Arg Ser Leu
1               5                   10                  15


Leu Glu Cys Ser Ala Glu Glu Ile Ala Gly Arg Trp Leu Gln Ala Thr
            20                  25                  30


Asp Leu Asn Arg Glu Val Tyr Gln His Leu Ala His Cys Val Pro Lys
            35                  40                  45


Ile Tyr Cys Arg Gly Pro Asn Pro Phe Pro Gln Lys Glu Asp Thr Leu
    50                  55                  60


Ala Gln His Ile Leu Leu Gly Pro Met Glu Trp Tyr Ile Cys Ala Glu
65                  70                  75                  80


Asp Pro Ala Leu Gly Phe Pro Lys Leu Glu Gln Ala Asn Lys Pro Ser
                85                  90                  95


His Leu Cys Gly Arg Val Phe Lys Val Gly Glu Pro Thr Tyr Ser Cys
            100                 105                 110


Arg Asp Cys Ala Val Asp Pro Thr Cys Val Leu Cys Met Glu Cys Phe
            115                 120                 125


Leu Gly Ser Ile His Arg Asp His Arg Tyr Arg Met Thr Thr Ser Gly
    130                 135                 140


Gly Gly Gly Phe Cys Asp Cys Gly Asp Thr Glu Ala Trp Lys Glu Gly
145                 150                 155                 160


Pro Tyr Cys Gln Lys His Lys Leu Ser Ser Ser Glu Val Val Glu Glu
                165                 170                 175
```

```
Glu Asp Pro Leu Val His Leu Ser Glu Asp Val Ile Ala Arg Thr Tyr
        180             185             190

Asn Ile Phe Ala Ile Met Phe Arg Tyr Ala Val Asp Ile Leu Thr Trp
        195             200             205

Glu Lys Glu Ser Glu Leu Pro Glu Asp Leu Glu Val Ala Glu Lys Ser
    210             215             220

Asp Thr Tyr Tyr Cys Met Leu Phe Asn Asp Glu Val His Thr Tyr Glu
225             230             235             240

Gln Val Ile Tyr Thr Leu Gln Lys Ala Val Asn Cys Thr Gln Lys Glu
            245             250             255

Ala Ile Gly Phe Ala Thr Thr Val Asp Arg Asp Gly Arg Arg Pro Val
            260             265             270

Arg Tyr Gly Asp Phe Gln Tyr Cys Asp Gln Ala Lys Thr Val Ile Val
        275             280             285

Arg Asn Thr Ser Arg Gln Thr Lys Pro Leu Lys Val Gln Val Met His
    290             295             300

Ser Ser Val Ala Ala His Gln Asn Phe Gly Leu Lys Ala Leu Ser Trp
305             310             315             320

Leu Gly Ser Val Ile Gly Tyr Ser Asp Gly Leu Arg Arg Ile Leu Cys
            325             330             335

Gln Val Gly Leu Gln Glu Gly Pro Asp Gly Glu Asn Ser Ser Leu Val
        340             345             350

Asp Arg Leu Met Leu Asn Asp Ser Lys Leu Trp Lys Gly Ala Arg Ser
        355             360             365

Val Tyr His Gln Leu Phe Met Ser Ser Leu Leu Met Asp Leu Lys Tyr
    370             375             380

Lys Lys Leu Phe Ala Leu Arg Phe Ala Lys Asn Tyr Arg Gln Leu Gln
385             390             395             400

Arg Asp Phe Met Glu Asp Asp His Glu Arg Ala Val Ser Val Thr Ala
            405             410             415

Leu Ser Val Gln Phe Phe Thr Ala Pro Thr Leu Ala Arg Met Leu Leu
        420             425             430
```

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```
Thr Glu Glu Asn Leu Met Thr Val Ile Ile Lys Ala Phe Met Asp His
        435                 440                 445

Leu Lys His Arg Asp Ala Gln Gly Arg Phe Gln Phe Glu Arg Tyr Thr
        450                 455                 460

Ala Leu Gln Ala Phe Lys Phe Arg Arg Val Gln Ser Leu Ile Leu Asp
465                 470                 475                 480

Leu Lys Tyr Val Leu Ile Ser Lys Pro Thr Glu Trp Ser Asp Glu Leu
                485                 490                 495

Arg Gln Lys Phe Leu Gln Gly Phe Asp Ala Phe Leu Glu Leu Leu Lys
            500                 505                 510

Cys Met Gln Gly Met Asp Pro Ile Thr Arg Gln Val Gly Gln His Ile
        515                 520                 525

Glu Met Glu Pro Glu Trp Glu Ala Ala Phe Thr Leu Gln Met Lys Leu
    530                 535                 540

Thr His Val Ile Ser Met Val Gln Asp Trp Cys Ala Leu Asp Glu Lys
545                 550                 555                 560

Val Leu Ile Glu Ala Tyr Lys Lys Cys Leu Ala Val Leu Thr Gln Cys
                565                 570                 575

His Gly Gly Phe Thr Asp Gly Glu Gln Pro Ile Thr Leu Ser Ile Cys
            580                 585                 590

Gly His Ser Val Glu Thr Ile Arg Tyr Cys Val Ser Gln Glu Lys Val
        595                 600                 605

Ser Ile His Leu Pro Ile Ser Arg Leu Leu Ala Gly Leu His Val Leu
    610                 615                 620

Leu Ser Lys Ser Glu Val Ala Tyr Lys Phe Pro Glu Leu Leu Pro Leu
625                 630                 635                 640

Ser Glu Leu Ser Pro Pro Met Leu Ile Glu His Pro Leu Arg Cys Leu
            645                 650                 655

Val Leu Cys Ala Gln Val His Ala Gly Met Trp Arg Arg Asn Gly Phe
        660                 665                 670

Ser Leu Val Asn Gln Ile Tyr Tyr Tyr His Asn Val Lys Cys Arg Arg
        675                 680                 685
```

```
Glu Met Phe Asp Lys Asp Ile Val Met Leu Gln Thr Gly Val Ser Met
    690             695             700

Met Asp Pro Asn His Phe Leu Met Ile Met Leu Ser Arg Phe Glu Leu
705             710             715             720

Tyr Gln Leu Phe Ser Thr Pro Asp Tyr Gly Lys Arg Phe Ser Ser Glu
            725             730             735

Val Thr His Lys Asp Val Val Gln Gln Asn Asn Thr Leu Ile Glu Glu
            740             745             750

Met Leu Tyr Leu Ile Ile Met Leu Val Gly Glu Arg Phe Asn Pro Gly
        755             760             765

Val Gly Gln Val Ala Ala Thr Asp Glu Ile Lys Arg Glu Ile Ile His
    770             775                 780

Gln Leu Ser Ile Lys Pro Met Ala His Ser Glu Leu Val Lys Ser Leu
785             790             795             800

Pro Glu Asp Glu Asn Lys Glu Thr Gly Met Glu Ser Val Ile Glu Ser
            805             810             815

Val Ala His Phe Lys Lys Pro Gly Leu Thr Gly Arg Gly Met Tyr Glu
            820             825             830

Leu Lys Pro Glu Cys Ala Lys Glu Phe Asn Leu Tyr Phe Tyr His Phe
        835             840             845

Ser Arg Ala Glu Gln Ser Lys Ala Glu Glu Ala Gln Arg Lys Leu Lys
    850             855             860

Arg Glu Asn Lys Glu Asp Thr Ala Leu Pro Pro Pro Ala Leu Pro Pro
865             870             875             880

Phe Cys Pro Leu Phe Ala Ser Leu Val Asn Ile Leu Gln Cys Asp Val
            885             890             895

Met Leu Tyr Ile Met Gly Thr Ile Leu Gln Trp Ala Val Glu His His
        900             905             910

Gly Ser Ala Trp Ser Glu Ser Met Leu Gln Arg Val Leu His Leu Ile
        915             920             925

Gly Met Ala Leu Gln Glu Glu Lys His His Leu Glu Asn Ala Val Glu
    930             935             940
```

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```
Gly His Val Gln Thr Phe Thr Phe Thr Gln Lys Ile Ser Lys Pro Gly
945                 950                 955                 960


Asp Ala Pro His Asn Ser Pro Ser Ile Leu Ala Met Leu Glu Thr Leu
                965                 970                 975


Gln Asn Ala Pro Ser Leu Glu Ala His Lys Asp Met Ile Arg Trp Leu
                980                 985                 990


Leu Lys Met Phe Asn Ala Ile Lys  Lys Ile Arg Glu Cys  Ser Ser Ser
            995                 1000                1005


Ser Pro Val Ala Glu Ala Glu  Gly Thr Ile Met Glu  Glu Ser Ser
    1010                1015                1020


Arg Asp Lys Asp Lys Ala Glu  Arg Lys Arg Lys Ala  Glu Ile Ala
    1025                1030                1035


Arg Leu Arg Arg Glu Lys Ile  Met Ala Gln Met Ser  Glu Met Gln
    1040                1045                1050


Arg His Phe Ile Asp Glu Asn  Lys Glu Leu Phe Gln  Gln Thr Leu
    1055                1060                1065


Glu Leu Asp Thr Ser Ala Ser  Ala Thr Leu Asp Ser  Ser Pro Pro
    1070                1075                1080


Val Ser Asp Ala Ala Leu Thr  Ala Leu Gly Pro Ala  Gln Thr Gln
    1085                1090                1095


Val Pro Glu Pro Arg Gln Phe  Val Thr Cys Ile Leu  Cys Gln Glu
    1100                1105                1110


Glu Gln Glu Val Thr Val Gly  Ser Arg Ala Met Val  Leu Ala Ala
    1115                1120                1125


Phe Val Gln Arg Ser Thr Val  Leu Ser Lys Asp Arg  Thr Lys Thr
    1130                1135                1140


Ile Ala Asp Pro Glu Lys Tyr  Asp Pro Leu Phe Met  His Pro Asp
    1145                1150                1155


Leu Ser Cys Gly Thr His Thr  Gly Ser Cys Gly His  Val Met His
    1160                1165                1170


Ala His Cys Trp Gln Arg Tyr  Phe Asp Ser Val Gln  Ala Lys Glu
    1175                1180                1185
```

```
Gln Arg  Arg Gln Gln Arg Leu  Arg Leu His Thr Ser  Tyr Asp Val
    1190             1195          1200

Glu Asn  Gly Glu Phe Leu Cys  Pro Leu Cys Glu Cys  Leu Ser Asn
    1205             1210          1215

Thr Val  Ile Pro Leu Leu Leu  Pro Pro Arg Ser Ile  Leu Ser Arg
    1220             1225          1230

Arg Leu  Asn Phe Ser Asp Gln  Pro Asp Leu Ala Gln  Trp Thr Arg
    1235             1240          1245

Ala Val  Thr Gln Gln Ile Lys  Val Val Gln Met Leu  Arg Arg Lys
    1250             1255          1260

His Asn  Ala Ala Asp Thr Ser  Ser Ser Glu Asp Thr  Glu Ala Met
    1265             1270          1275

Asn Ile  Ile Pro Ile Pro Glu  Gly Phe Arg Pro Asp  Phe Tyr Pro
    1280             1285          1290

Arg Asn  Pro Tyr Ser Asp Ser  Ile Lys Glu Met Leu  Thr Thr Phe
    1295             1300          1305

Gly Thr  Ala Ala Tyr Lys Val  Gly Leu Lys Val His  Pro Asn Glu
    1310             1315          1320

Gly Asp  Pro Arg Val Pro Ile  Leu Cys Trp Gly Thr  Cys Ala Tyr
    1325             1330          1335

Thr Ile  Gln Ser Ile Glu Arg  Ile Leu Ser Asp Glu  Glu Lys Pro
    1340             1345          1350

Val Phe  Gly Pro Leu Pro Cys  Arg Leu Asp Asp Cys  Leu Arg Ser
    1355             1360          1365

Leu Thr  Arg Phe Ala Ala Ala  His Trp Thr Val Ala  Leu Leu Pro
    1370             1375          1380

Val Val  Gln Gly His Phe Cys  Lys Leu Phe Ala Ser  Leu Val Pro
    1385             1390          1395

Ser Asp  Ser Tyr Glu Asp Leu  Pro Cys Ile Leu Asp  Ile Asp Met
    1400             1405          1410

Phe His  Leu Leu Val Gly Leu  Val Leu Ala Phe Pro  Ala Leu Gln
    1415             1420          1425
```

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```
Cys Gln  Asp Phe Ser Gly Ser  Ser Leu Ala Thr Gly  Asp Leu His
    1430            1435            1440


Ile Phe  His Leu Val Thr Met  Ala His Ile Val Gln  Ile Leu Leu
    1445            1450            1455


Thr Ser  Cys Thr Glu Glu Asn  Gly Met Asp Gln Glu  Asn Pro Thr
    1460            1465            1470


Gly Glu  Glu Glu Leu Ala Ile  Leu Ser Leu His Lys  Thr Leu His
    1475            1480            1485


Gln Tyr  Thr Gly Ser Ala Leu  Lys Glu Ala Pro Ser  Gly Trp His
    1490            1495            1500


Leu Trp  Arg Ser Val Arg Ala  Ala Ile Met Pro Phe  Leu Lys Cys
    1505            1510            1515


Ser Ala  Leu Phe Phe His Tyr  Leu Asn Gly Val Pro  Ala Pro Pro
    1520            1525            1530


Asp Leu  Gln Val Ser Gly Thr  Ser His Phe Glu His  Leu Cys Asn
    1535            1540            1545


Tyr Leu  Ser Leu Pro Thr Asn  Leu Ile His Leu Phe  Gln Glu Asn
    1550            1555            1560


Ser Asp  Ile Met Asn Ser Leu  Ile Glu Ser Trp Cys  Gln Asn Ser
    1565            1570            1575


Glu Val  Lys Arg Tyr Leu Asn  Gly Glu Arg Gly Ala  Ile Ser Tyr
    1580            1585            1590


Pro Arg  Gly Ala Asn Lys Leu  Ile Asp Leu Pro Glu  Asp Tyr Ser
    1595            1600            1605


Ser Leu  Ile Asn Gln Ala Ser  Asn Phe Ser Cys Pro  Lys Ser Gly
    1610            1615            1620


Gly Asp  Lys Ser Arg Ala Pro  Thr Leu Cys Leu Val  Cys Gly Ser
    1625            1630            1635


Leu Leu  Cys Ser Gln Ser Tyr  Cys Cys Gln Ala Glu  Leu Glu Gly
    1640            1645            1650


Glu Asp  Val Gly Ala Cys Thr  Ala His Thr Tyr Ser  Cys Gly Ser
    1655            1660            1665
```

```
Gly Ala  Gly Ile Phe Leu Arg  Val Arg Glu Cys Gln  Val Leu Phe
    1670                 1675              1680


Leu Ala  Gly Lys Thr Lys Gly  Cys Phe Tyr Ser Pro  Pro Tyr Leu
    1685                 1690              1695


Asp Asp  Tyr Gly Glu Thr Asp  Gln Gly Leu Arg Arg  Gly Asn Pro
    1700                 1705              1710


Leu His  Leu Cys Gln Glu Arg  Phe Arg Lys Ile Gln  Lys Leu Trp
    1715                 1720              1725


Gln Gln  His Ser Ile Thr Glu  Glu Ile Gly His Ala  Gln Glu Ala
    1730                 1735              1740


Asn Gln  Thr Leu Val Gly Ile  Asp Trp Gln His Leu
    1745                 1750              1755


<210>  7
<211>  21
<212>  DNA
<213>  Artificial sequence

<220>
<223>  Synthetic primer

<400>  7
ctgctcgagt ctgcgtcaaa c                                          21


<210>  8
<211>  24
<212>  DNA
<213>  Artificial sequence

<220>
<223>  Synthetic primer

<400>  8
tctcgatatg ttgcagcctt gcta                                       24


<210>  9
<211>  23
<212>  DNA
<213>  Artificial sequence

<220>
<223>  Synthetic primer

<400>  9
gtatgaactt gccgaggctt tta                                        23


<210>  10
<211>  23
<212>  DNA
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<213>   Artificial sequence

<220>
<223>   Synthetic primer

<400>   10
caatactttc ccagccctca gaa                                              23


<210>   11
<211>   18
<212>   DNA
<213>   Artificial sequence

<220>
<223>   Synthetic primer

<400>   11
atggcgtcgc tagagcca                                                    18


<210>   12
<211>   23
<212>   DNA
<213>   Artificial sequence

<220>
<223>   Synthetic primer

<400>   12
caaagcggct gagcatgatc atc                                              23


<210>   13
<211>   23
<212>   DNA
<213>   Artificial sequence

<220>
<223>   Synthetic primer

<400>   13
tgaacagcca atcacactaa gca                                              23


<210>   14
<211>   20
<212>   DNA
<213>   Artificial sequence

<220>
<223>   Synthetic primer

<400>   14
ttataaatgc caaatgccaa                                                  20


<210>   15
<211>   1757
<212>   PRT
<213>   Mus musculus

<400>   15
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Met Ala Asp Glu Glu Met Asp Gly Ala Glu Arg Met Asp Val Ser Pro
1               5                   10                  15

Glu Pro Pro Leu Ala Pro Gln Arg Pro Ala Ser Trp Trp Asp Gln Gln
            20                  25                  30

Val Asp Phe Tyr Thr Ala Phe Leu His His Leu Ala Gln Leu Val Pro
        35                  40                  45

Glu Ile Tyr Phe Ala Glu Met Asp Pro Asp Leu Glu Lys Gln Glu Glu
    50                  55                  60

Ser Val Gln Met Ser Ile Leu Thr Pro Leu Glu Trp Tyr Leu Phe Gly
65                  70                  75                  80

Glu Asp Pro Asp Ile Cys Leu Glu Lys Leu Lys His Ser Gly Ala Phe
                85                  90                  95

Gln Leu Cys Gly Lys Val Phe Lys Ser Gly Glu Thr Thr Tyr Ser Cys
            100                 105                 110

Arg Asp Cys Ala Ile Asp Pro Thr Cys Val Leu Cys Met Asp Cys Phe
        115                 120                 125

Gln Ser Ser Val His Lys Asn His Arg Tyr Lys Met His Thr Ser Thr
    130                 135                 140

Gly Gly Gly Phe Cys Asp Cys Gly Asp Thr Glu Ala Trp Lys Thr Gly
145                 150                 155                 160

Pro Phe Cys Val Asp His Glu Pro Gly Arg Ala Gly Thr Thr Lys Glu
                165                 170                 175

Ser Leu His Cys Pro Leu Asn Glu Glu Val Ile Ala Gln Ala Arg Arg
        180                 185                 190

Ile Phe Pro Ser Val Ile Lys Tyr Ile Val Glu Met Thr Ile Trp Glu
        195                 200                 205

Glu Glu Lys Glu Leu Pro Pro Glu Leu Gln Ile Arg Glu Lys Asn Glu
    210                 215                 220

Arg Tyr Tyr Cys Val Leu Phe Asn Asp Glu His His Ser Tyr Asp His
225                 230                 235                 240

Val Ile Tyr Ser Leu Gln Arg Ala Leu Asp Cys Glu Leu Ala Glu Ala
            245                 250                 255
```

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```
Gln Leu His Thr Thr Ala Ile Asp Lys Glu Gly Arg Arg Ala Val Lys
        260             265             270

Ala Gly Val Tyr Ala Thr Cys Gln Glu Ala Lys Glu Asp Ile Lys Ser
        275             280             285

His Ser Glu Asn Val Ser Gln His Pro Leu His Val Glu Val Leu His
        290             295             300

Ser Val Val Met Ala His Gln Lys Phe Ala Leu Arg Leu Gly Ser Trp
305             310             315             320

Met Asn Lys Ile Met Ser Tyr Ser Ser Asp Phe Arg Gln Ile Phe Cys
                325             330             335

Gln Ala Cys Leu Val Glu Glu Pro Gly Ser Glu Asn Pro Cys Leu Ile
            340             345             350

Ser Arg Leu Met Leu Trp Asp Ala Lys Leu Tyr Lys Gly Ala Arg Lys
        355             360             365

Ile Leu His Glu Leu Ile Phe Ser Ser Phe Phe Met Glu Met Glu Tyr
    370             375             380

Lys Lys Leu Phe Ala Met Glu Phe Val Lys Tyr Tyr Lys Gln Leu Gln
385             390             395             400

Lys Glu Tyr Ile Ser Asp Asp His Glu Arg Ser Ile Ser Ile Thr Ala
            405             410             415

Leu Ser Val Gln Met Leu Thr Val Pro Thr Leu Ala Arg His Leu Ile
        420             425             430

Glu Glu Gln Asn Val Ile Ser Val Ile Thr Glu Thr Leu Leu Glu Val
        435             440             445

Leu Pro Glu Tyr Leu Asp Arg Asn Asn Lys Phe Asn Phe Gln Gly Tyr
    450             455             460

Ser Gln Asp Lys Leu Gly Arg Val Tyr Ala Val Ile Cys Asp Leu Lys
465             470             475             480

Tyr Ile Leu Ile Ser Lys Pro Val Ile Trp Thr Glu Arg Leu Arg Ala
            485             490             495

Gln Phe Leu Glu Gly Phe Arg Ser Phe Leu Lys Ile Leu Thr Cys Met
        500             505             510
```

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```
Gln Gly Met Glu Glu Ile Arg Arg Gln Val Gly Gln His Ile Glu Val
        515             520             525

Asp Pro Asp Trp Glu Ala Ala Ile Ala Ile Gln Met Gln Leu Lys Asn
    530             535                 540

Ile Leu Leu Met Phe Gln Glu Trp Cys Ala Cys Asp Glu Asp Leu Leu
545             550                 555                 560

Leu Val Ala Tyr Lys Glu Cys His Lys Ala Val Met Arg Cys Ser Thr
            565             570                 575

Asn Phe Met Ser Ser Thr Lys Thr Val Val Gln Leu Cys Gly His Ser
        580             585                 590

Leu Glu Thr Lys Ser Tyr Lys Val Ser Glu Asp Leu Val Ser Ile His
        595             600                 605

Leu Pro Leu Ser Arg Thr Leu Ala Gly Leu His Val Arg Leu Ser Arg
    610             615                 620

Leu Gly Ala Ile Ser Arg Leu His Glu Phe Val Pro Phe Asp Ser Phe
625             630                 635                 640

Gln Val Glu Val Leu Val Glu Tyr Pro Leu Arg Cys Leu Val Leu Val
            645                 650                 655

Ala Gln Val Val Ala Glu Met Trp Arg Arg Asn Gly Leu Ser Leu Ile
            660                 665                 670

Ser Gln Val Phe Tyr Tyr Gln Asp Val Lys Cys Arg Glu Glu Met Tyr
        675             680                 685

Asp Lys Asp Ile Ile Met Leu Gln Ile Gly Ala Ser Ile Met Asp Pro
    690             695                 700

Asn Lys Phe Leu Leu Leu Val Leu Gln Arg Tyr Glu Leu Thr Asp Ala
705             710                 715                 720

Phe Asn Lys Thr Ile Ser Thr Lys Asp Gln Asp Leu Ile Lys Gln Tyr
            725             730                 735

Asn Thr Leu Ile Glu Glu Met Leu Gln Val Leu Ile Tyr Ile Val Gly
        740             745                 750

Glu Arg Tyr Val Pro Gly Val Gly Asn Val Thr Arg Glu Glu Val Ile
        755             760                 765
```

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```
Met Arg Glu Ile Thr His Leu Leu Cys Ile Glu Pro Met Pro His Ser
    770             775             780

Ala Ile Ala Arg Asn Leu Pro Glu Asn Glu Asn Asn Glu Thr Gly Leu
785             790             795             800

Glu Asn Val Ile Asn Lys Val Ala Thr Phe Lys Lys Pro Gly Val Ser
                805             810             815

Gly His Gly Val Tyr Glu Leu Lys Asp Glu Ser Leu Lys Asp Phe Asn
            820             825             830

Met Tyr Phe Tyr His Tyr Ser Lys Thr Gln His Ser Lys Ala Glu His
        835             840             845

Met Gln Lys Lys Arg Arg Lys Gln Glu Asn Lys Asp Glu Ala Leu Pro
    850             855             860

Pro Pro Pro Pro Pro Glu Phe Cys Pro Ala Phe Ser Lys Val Val Asn
865             870             875             880

Leu Leu Ser Cys Asp Val Met Ile Tyr Ile Leu Arg Thr Ile Phe Glu
            885             890             895

Arg Ala Val Asp Thr Glu Ser Asn Leu Trp Thr Glu Gly Met Leu Gln
            900             905             910

Met Ala Phe His Ile Leu Ala Leu Gly Leu Leu Glu Glu Lys Gln Gln
        915             920             925

Leu Gln Lys Ala Pro Glu Glu Glu Val Ala Phe Asp Phe Tyr His Lys
    930             935             940

Ala Ser Arg Leu Gly Ser Ser Ala Met Asn Ala Gln Asn Ile Gln Met
945             950             955             960

Leu Leu Glu Arg Leu Lys Gly Ile Pro Gln Leu Glu Gly Gln Lys Asp
            965             970             975

Met Ile Thr Trp Ile Leu Gln Met Phe Asp Thr Val Lys Arg Leu Arg
            980             985             990

Glu Lys Ser Cys Leu Val Val Ala Thr Thr Ser Gly Leu Glu Cys Ile
        995             1000            1005

Lys Ser Glu Glu Ile Thr His Asp Lys Glu Lys Ala Glu Arg Lys
    1010            1015            1020
```

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Arg Lys Ala Glu Ala Ala Arg Leu His Arg Gln Lys Ile Met Ala
    1025   1030   1035

Gln Met Ser Ala Leu Gln Lys Asn Phe Ile Glu Thr His Lys Leu
    1040   1045   1050

Met Tyr Asp Asn Thr Ser Glu Val Thr Gly Lys Glu Asp Ser Ile
    1055   1060   1065

Met Glu Glu Glu Ser Thr Ser Ala Val Ser Glu Ala Ser Arg Ile
    1070   1075   1080

Ala Leu Gly Pro Lys Arg Gly Pro Ala Val Thr Glu Lys Glu Val
    1085   1090   1095

Leu Thr Cys Ile Leu Cys Gln Glu Glu Gln Glu Val Lys Leu Glu
    1100   1105   1110

Asn Asn Ala Met Val Leu Ser Ala Cys Val Gln Lys Ser Thr Ala
    1115   1120   1125

Leu Thr Gln His Arg Gly Lys Pro Val Asp His Leu Gly Glu Thr
    1130   1135   1140

Leu Asp Pro Leu Phe Met Asp Pro Asp Leu Ala His Gly Thr Tyr
    1145   1150   1155

Thr Gly Ser Cys Gly His Val Met His Ala Val Cys Trp Gln Lys
    1160   1165   1170

Tyr Phe Glu Ala Val Gln Leu Ser Ser Gln Gln Arg Ile His Val
    1175   1180   1185

Asp Leu Phe Asp Leu Glu Ser Gly Glu Tyr Leu Cys Pro Leu Cys
    1190   1195   1200

Lys Ser Leu Cys Asn Thr Val Ile Pro Ile Ile Pro Leu Gln Pro
    1205   1210   1215

Gln Lys Ile Asn Ser Glu Asn Ala Glu Ala Leu Ala Gln Leu Leu
    1220   1225   1230

Thr Leu Ala Arg Trp Ile Gln Thr Val Leu Ala Arg Ile Ser Gly
    1235   1240   1245

Tyr Asn Ile Lys His Ala Lys Gly Glu Ala Pro Ala Val Pro Val
    1250   1255   1260

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Leu Phe Asn Gln Gly Met Gly Asp Ser Thr Phe Glu Phe His Ser
    1265   1270   1275

Ile Leu Ser Phe Gly Val Gln Ser Ser Val Lys Tyr Ser Asn Ser
    1280   1285   1290

Ile Lys Glu Met Val Ile Leu Phe Ala Thr Thr Ile Tyr Arg Ile
    1295   1300   1305

Gly Leu Lys Val Pro Pro Asp Glu Leu Asp Pro Arg Val Pro Met
    1310   1315   1320

Met Thr Trp Ser Thr Cys Ala Phe Thr Ile Gln Ala Ile Glu Asn
    1325   1330   1335

Leu Leu Gly Asp Glu Gly Lys Pro Leu Phe Gly Ala Leu Gln Asn
    1340   1345   1350

Arg Gln His Ser Gly Leu Lys Ala Leu Met Gln Phe Ala Val Ala
    1355   1360   1365

Gln Arg Ala Thr Cys Pro Gln Val Leu Ile His Lys His Leu Ala
    1370   1375   1380

Arg Leu Leu Ser Val Ile Leu Pro Asn Leu Gln Ser Glu Asn Thr
    1385   1390   1395

Pro Gly Leu Leu Ser Val Asp Leu Phe His Val Leu Val Gly Ala
    1400   1405   1410

Val Leu Ala Phe Pro Ser Leu Tyr Trp Asp Asp Thr Val Asp Leu
    1415   1420   1425

Gln Pro Ser Pro Leu Ser Ser Ser Tyr Asn His Leu Tyr Leu Phe
    1430   1435   1440

His Leu Ile Thr Met Ala His Met Leu Gln Ile Leu Leu Thr Thr
    1445   1450   1455

Asp Thr Asp Leu Ser Pro Gly Pro Pro Leu Ala Glu Gly Glu Glu
    1460   1465   1470

Asp Ser Glu Glu Ala Arg Cys Ala Ser Ala Phe Phe Val Glu Val
    1475   1480   1485

Ser Gln His Thr Asp Gly Leu Thr Gly Cys Gly Ala Pro Gly Trp
    1490   1495   1500

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```
Tyr Leu  Trp Leu Ser Leu Arg  Asn Gly Ile Thr Pro  Tyr Leu Arg
    1505             1510             1515

Cys Ala  Ala Leu Leu Phe His  Tyr Leu Leu Gly Val  Ala Pro Pro
    1520             1525             1530

Glu Glu  Leu Phe Ala Asn Ser  Ala Glu Gly Glu Phe  Ser Ala Leu
    1535             1540             1545

Cys Ser  Tyr Leu Ser Leu Pro  Thr Asn Leu Phe Leu  Leu Phe Gln
    1550             1555             1560

Glu Tyr  Trp Asp Thr Ile Arg  Pro Leu Leu Gln Arg  Trp Cys Gly
    1565             1570             1575

Asp Pro  Ala Leu Leu Lys Ser  Leu Lys Gln Lys Ser  Ala Val Val
    1580             1585             1590

Arg Tyr  Pro Arg Lys Arg Asn  Ser Leu Ile Glu Leu  Pro Glu Asp
    1595             1600             1605

Tyr Ser  Cys Leu Leu Asn Gln  Ala Ser His Phe Arg  Cys Pro Arg
    1610             1615             1620

Ser Ala  Asp Asp Glu Arg Lys  His Pro Val Leu Cys  Leu Phe Cys
    1625             1630             1635

Gly Ala  Ile Leu Cys Ser Gln  Asn Ile Cys Cys Gln  Glu Ile Val
    1640             1645             1650

Asn Gly  Glu Glu Val Gly Ala  Cys Val Phe His Ala  Leu His Cys
    1655             1660             1665

Gly Ala  Gly Val Cys Ile Phe  Leu Lys Ile Arg Glu  Cys Arg Val
    1670             1675             1680

Val Leu  Val Glu Gly Lys Ala  Arg Gly Cys Ala Tyr  Pro Ala Pro
    1685             1690             1695

Tyr Leu  Asp Glu Tyr Gly Glu  Thr Asp Pro Gly Leu  Lys Arg Gly
    1700             1705             1710

Asn Pro  Leu His Leu Ser Arg  Glu Arg Tyr Arg Lys  Leu His Leu
    1715             1720             1725

Val Trp  Gln Gln His Cys Ile  Ile Glu Glu Ile Ala  Arg Ser Gln
    1730             1735             1740
```

```
Glu Thr  Asn Gln Met Leu Phe  Gly Phe Asn Trp Gln  Leu Leu
    1745               1750                1755
```

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<210>  16
<211>  11
<212>  PRT
<213>  Artificial sequence

<220>
<223>  Synthetic peptide

<400>  16
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Tyr Gly Arg Lys Lys Arg Arg Gln Arg Arg Arg
1               5                   10
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<210>  17
<211>  15
<212>  PRT
<213>  Artificial sequence

<220>
<223>  Synthetic peptide

<400>  17
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Gly Gly Gly Gly Tyr Gly Arg Lys Lys Arg Arg Gln Arg Arg Arg
1               5                   10                  15
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<210>  18
<211>  5205
<212>  DNA
<213>  Homo sapiens


<220>
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<222>  (662)..(662)
<223>  n = a, c, g, or t

<220>
<221>  misc_feature
<222>  (668)..(668)
<223>  n = a, c, g, or t

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acccctcagc gtctggcatc ttggtgggat cagcaagttg atttttatac tgctttcttg     120

catcatttgg cacaattggt gccagaaatt tactttgctg aaatggaccc agacttggaa     180

aagcaggagg aaagtgtaca aatgtcaata ttcactccac tggaatggta cttatttgga     240

gaagatccag atatttgctt agagaaattg aagcacagtg gagcatttca gctttgtggg     300

agggttttca aaagtggaga gacaacctat tcttgcaggg attgtgcaat tgatccaaca     360

tgtgtactct gtatggactg cttccaggac agtgttcata aaaatcatcg ttacaagatg     420
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```
catacttcta ctggaggagg gttctgtgac tgtggagaca cagaggcatg gaaaactggc      480

cctttttgtg taaatcatga acctggaaga gcaggtacta taaaagagaa ttcacgctgt      540

ccgttgaatg aagaggtaat tgtccaagcc aggaaaatat ttccttcagt gataaaatat      600

gtcgtagaaa tgactatatg ggaagaggaa aaagaactgc ctcctgaact ccagataagg      660

knryycvndh hsydhgtcat atacagccta caaagagctc ttgactgtga gctcgcagag      720

gcccagttgc ataccactgc cattgacaaa gagggtcgtc gggctgttaa agcgggagct      780

tatgctgctt gccaggaagc aaaggaagat ataaagagtc attcagaaaa tgtctctcaa      840

catccacttc atgtagaagt attacactca gagattatgg ctcatcagaa atttgctttg      900

cgtcttggtt cctggatgaa caaaattatg agctattcaa gtgactttag gcagatcttt      960

tgccaagcat gccttagaga agaacctgac tcggagaatc cctgtctcat aagcaggtta     1020

atgctttggg atgcaaagct ttataaaggt gcccgtaaga tccttcatga attgatcttc     1080

agcagttttt ttatggagat ggaatacaaa aaactctttg ctatggaatt tgtgaagtat     1140

tataaacaac tgcagaaaga atatatcagt gatgatcatg acagaagtat ctctataact     1200

gcactttcag ttcagatgtt tactgttcct actctggctc gacatcttat tgaagagcag     1260

aatgttatct ctgtcattac tgaaactctg ctagaagttt tacctgagta cttggacagg     1320

aacaataaat tcaacttcca gggttatagc caggacaaat tgggaagagt atatgcagta     1380

atatgtgacc taaagtatat cctgatcagc aaacccacaa tatggacaga aagattaaga     1440

atgcagttcc ttgaaggttt tcgatctttt ttgaagattc ttacctgtat gcagggaatg     1500

gaagaaatcc gaagacaggt tgggcaacac attgaagtgg atcctgattg ggaggctgcc     1560

attgctatac agatgcaatt gaagaatatt ttactcatgt ccaagagtg gtgtgcttgt      1620

gatgaagaac tcttacttgt ggcttataaa gaatgtcaca agctgtgat gaggtgcagt      1680

accagtttca tatctagtag caagacagta gtacaatcgt gtggacatag tttggaaaca     1740

aagtcctaca gagtatctga ggatcttgta agcatacatc tgccactctc taggaccctt     1800

gctggtcttc atgtacgttt aagcaggctg ggtgctgttt caagactgca tgaatttgtg     1860

tcttttgagg actttcaagt agaggtacta gtggaatatc ctttacgttg tctggtgttg     1920

gttgcccagg ttgttgctga gatgtggcga agaaatggac tgtctcttat tagccaggtg     1980

ttttattacc aagatgttaa gtgcagagaa gaaatgtatg ataaagatat catcatgctt     2040

cagattggtg catctttaat ggatcccaat aagttcttgt tactggtact tcagaggtat     2100

gaacttgccg aggctttaa caagaccata tctacaaaag accaggattt gattaaacaa     2160

tataatacac taatagaaga aatgcttcag gtcctcatct atattgtggg tgagcgttat     2220

gtacctggag tgggaaatgt gaccaaagaa gaggtcacaa tgagagaaat cattcacttg     2280

ctttgcattg aacccatgcc acacagtgcc attgccaaaa atttacctga gaatgaaaat     2340
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aatgaaactg gcttagagaa tgtcataaac aaagtggcca catttaagaa accaggtgta    2400

tcaggccatg gagtttatga actaaaagat gaatcactga aagacttcaa tatgtacttt    2460

tatcattact ccaaaaccca gcatagcaag gctgaacata tgcagaagaa aaggagaaaa    2520

caagaaaaca aagatgaagc attgccgcca ccaccacctc ctgaattctg ccctgctttc    2580

agcaaagtga ttaaccttct caactgtgat atcatgatgt acattctcag gaccgtattt    2640

gagcgggcaa tagacacaga ttctaacttg tggaccgaag ggatgctcca aatggctttt    2700

catattctgg cattgggttt actagaagag aagcaacagc ttcaaaaagc tcctgaagaa    2760

gaagtaacat ttgactttta tcataaggct tcaagattgg gaagttcagc catgaatata    2820

caaatgcttt tggaaaaact caaaggaatt ccccagttag aaggccagaa ggacatgata    2880

acgtggatac ttcagatgtt tgacacagtg aagcgattaa gagaaaaatc ttgtttaatt    2940

gtagcaacca catcaggatc ggaatctatt aagaatgatg agattactca tgataaagaa    3000

aaagcagaac gaaaagaaa agctgaagct gctaggctac atcgccagaa gatcatggct    3060

cagatgtctg ccttacagaa aaacttcatt gaaactcata aactcatgta tgacaataca    3120

tcagaaatgc ctgggaaaga agattccatt atggaggaag agagcacccc agcagtcagt    3180

gactactcta gaattgcttt gggtcctaaa cggggtccat ctgttactga aaaggaggtg    3240

ctgacgtgca tcctttgcca agaagaacag gaggtgaaaa tagaaaataa tgccatggta    3300

ttatcggcct gtgtccagaa atctactgcc ttaacccagc acaggggaaa acccatagaa    3360

ctctcaggag aagccctaga cccacttttc atggatccag acttggcata tggaacttat    3420

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ctttgccctc tttgcaaatc tctgtgcaat actgtgatcc ccattattcc tttgcaacct    3600

caaaagataa acagtgagaa tgcagatgct cttgctcaac ttttgaccct ggcacggtgg    3660

atacagactg ttctggccag aatatcaggt tataatataa gacatgctaa aggagaaaac    3720

ccaattccta ttttcttttaa tcaaggaatg ggagattcta ctttggagtt ccattccatc    3780

ctgagttttg gcgttgagtc ttcgattaaa tattcaaata gcatcaagga aatggttatt    3840

ctctttgcca caacaattta tagaattgga ttgaaagtgc cacctgatga aagggatcct    3900

cgagtcccca tgctgacctg gagcacctgc gctttcacta tccaggcaat tgaaaatcta    3960

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aaagcattaa tgcagtttgc agttgcacag aggattacct gtcctcaggt cctgatacag    4080

aaacatctgg ttcgtcttct atcagttgtt cttcctaaca taaaatcaga agatacacca    4140

tgccttctgt ctatagatct gtttcatgtt ttggtgggtg ctgtgttagc attcccatcc    4200

ttgtattggg atgaccctgt tgatctgcag ccttcttcag ttagttcttc ctataaccac    4260
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ctttatctct tccatttgat caccatggca cacatgcttc agatactact tacagtagac   4320

acaggcctac cccttgctca ggttcaagaa gacagtgaag aggctcattc cgcatcttct   4380

ttctttgcag aaatttctca atatacaagt ggctccattg ggtgtgatat tcctggctgg   4440

tatttgtggg tctcactgaa gaatggcatc accccttatc ttcgctgtgc tgcattgttt   4500

ttccactatt tacttggggt aactccgcct gaggaactgc ataccaattc tgcagaagga   4560

gagtacagtg cactctgtag ctatctatct ttacctacaa atttgttcct gctcttccag   4620

gaatattggg atactgtaag gcccttgctc cagaggcggt gtgcagatcc tgccttacta   4680

aactgtttga agcaaaaaaa caccgtggtc aggtacccta gaaaagaaa tagtttgata   4740

gagcttcctg atgactatag ctgcctcctg aatcaagctt ctcatttcag gtgcccacgg   4800

tctgcagatg atgagcgaaa gcatcctgtc ctctgccttt tctgtggggc tatactatgt   4860

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cacgcacttc actgtggagc cggagtctgc attttcctaa aaatcagaga atgccgagtg   4980

gtcctggttg aaggtaaagc cagaggctgt gcctatccag ctccttactt ggatgaatat   5040

ggagaaacag accctggcct gaagaggggc aacccccttc atttatctcg tgagcggtat   5100

cggaagctcc atttggtctg gcaacaacac tgcattatag aagagattgc taggagccaa   5160

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<210> 19
<211> 1734
<212> PRT
<213> Homo sapiens

<400> 19

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Ala Met Glu Gly Asn Met Ala Asp Glu Glu Ala Gly Gly Thr Glu Arg
1               5                   10                  15

Met Glu Ile Ser Ala Glu Leu Pro Gln Thr Pro Gln Arg Leu Ala Ser
            20                  25                  30

Trp Trp Asp Gln Gln Val Asp Phe Tyr Thr Ala Phe Leu His His Leu
        35                  40                  45

Ala Gln Leu Val Pro Glu Ile Tyr Phe Ala Glu Met Asp Pro Asp Leu
    50                  55                  60

Glu Lys Gln Glu Glu Ser Val Gln Met Ser Ile Phe Thr Pro Leu Glu
65                  70                  75                  80

Trp Tyr Leu Phe Gly Glu Asp Pro Asp Ile Cys Leu Glu Lys Leu Lys
                85                  90                  95
```

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```
His Ser Gly Ala Phe Gln Leu Cys Gly Arg Val Phe Lys Ser Gly Glu
            100                 105                 110

Thr Thr Tyr Ser Cys Arg Asp Cys Ala Ile Asp Pro Thr Cys Val Leu
            115                 120                 125

Cys Met Asp Cys Phe Gln Asp Ser Val His Lys Asn His Arg Tyr Lys
    130                 135                 140

Met His Thr Ser Thr Gly Gly Gly Phe Cys Asp Cys Gly Asp Thr Glu
145                 150                 155                 160

Ala Trp Lys Thr Gly Pro Phe Cys Val Asn His Glu Pro Gly Arg Ala
            165                 170                 175

Gly Thr Ile Lys Glu Asn Ser Arg Cys Pro Leu Asn Glu Glu Val Ile
            180                 185                 190

Val Gln Ala Arg Lys Ile Phe Pro_Ser Val Ile Lys Tyr Val Val Glu
            195                 200                 205

Met Thr Ile Trp Glu Glu Glu Lys Glu Leu Pro Pro Glu Leu Gln Ile
    210                 215                 220

Arg Glu Lys Asn Glu Arg Tyr Tyr Cys Val Leu Phe Asn Asp Glu His
225                 230                 235                 240

His Ser Tyr Asp His Val Ile Tyr Ser Leu Gln Arg Ala Leu Asp Cys
            245                 250                 255

Glu Leu Ala Glu Ala Gln Leu His Thr Thr Ala Ile Asp Lys Glu Gly
            260                 265                 270

Arg Arg Ala Val Lys Ala Gly Ala Tyr Ala Ala Cys Gln Glu Ala Lys
            275                 280                 285

Glu Asp Ile Lys Ser His Ser Glu Asn Val Ser Gln His Pro Leu His
            290                 295                 300

Val Glu Val Leu His Ser Glu Ile Met Ala His Gln Lys Phe Ala Leu
305                 310                 315                 320

Arg Leu Gly Ser Trp Met Asn Lys Ile Met Ser Tyr Ser Ser Asp Phe
            325                 330                 335

Arg Gln Ile Phe Cys Gln Ala Cys Leu Arg Glu Glu Pro Asp Ser Glu
            340                 345                 350
```

```
Asn Pro Cys Leu Ile Ser Arg Leu Met Leu Trp Asp Ala Lys Leu Tyr
    355                 360                 365

Lys Gly Ala Arg Lys Ile Leu His Glu Leu Ile Phe Ser Ser Phe Phe
    370             375                 380

Met Glu Met Glu Tyr Lys Lys Leu Phe Ala Met Glu Phe Val Lys Tyr
385                 390                 395                 400

Tyr Lys Gln Leu Gln Lys Glu Tyr Ile Ser Asp Asp His Asp Arg Ser
                405                 410                 415

Ile Ser Ile Thr Ala Leu Ser Val Gln Met Phe Thr Val Pro Thr Leu
                420                 425                 430

Ala Arg His Leu Ile Glu Glu Gln Asn Val Ile Ser Val Ile Thr Glu
                435                 440                 445

Thr Leu Leu Glu Val Leu Pro Glu Tyr Leu Asp Arg Asn Asn Lys Phe
    450                 455                 460

Asn Phe Gln Gly Tyr Ser Gln Asp Lys Leu Gly Arg Val Tyr Ala Val
465                 470                 475                 480

Ile Cys Asp Leu Lys Tyr Ile Leu Ile Ser Lys Pro Thr Ile Trp Thr
                485                 490                 495

Glu Arg Leu Arg Met Gln Phe Leu Glu Gly Phe Arg Ser Phe Leu Lys
                500                 505                 510

Ile Leu Thr Cys Met Gln Gly Met Glu Glu Ile Arg Arg Gln Val Gly
                515                 520                 525

Gln His Ile Glu Val Asp Pro Asp Trp Glu Ala Ala Ile Ala Ile Gln
    530                 535                 540

Met Gln Leu Lys Asn Ile Leu Leu Met Phe Gln Glu Trp Cys Ala Cys
545                 550                 555                 560

Asp Glu Glu Leu Leu Leu Val Ala Tyr Lys Glu Cys His Lys Ala Val
                565                 570                 575

Met Arg Cys Ser Thr Ser Phe Ile Ser Ser Ser Lys Thr Val Val Gln
                580                 585                 590

Ser Cys Gly His Ser Leu Glu Thr Lys Ser Tyr Arg Val Ser Glu Asp
    595                 600                 605
```

```
Leu Val Ser Ile His Leu Pro Leu Ser Arg Thr Leu Ala Gly Leu His
    610             615             620

Val Arg Leu Ser Arg Leu Gly Ala Val Ser Arg Leu His Glu Phe Val
625             630             635                 640

Ser Phe Glu Asp Phe Gln Val Glu Val Leu Val Glu Tyr Pro Leu Arg
            645             650             655

Cys Leu Val Leu Val Ala Gln Val Val Ala Glu Met Trp Arg Arg Asn
            660             665             670

Gly Leu Ser Leu Ile Ser Gln Val Phe Tyr Tyr Gln Asp Val Lys Cys
        675             680             685

Arg Glu Glu Met Tyr Asp Lys Asp Ile Ile Met Leu Gln Ile Gly Ala
    690             695                 700

Ser Leu Met Asp Pro Asn Lys Phe Leu Leu Leu Val Leu Gln Arg Tyr
705             710             715                 720

Glu Leu Ala Glu Ala Phe Asn Lys Thr Ile Ser Thr Lys Asp Gln Asp
            725             730             735

Leu Ile Lys Gln Tyr Asn Thr Leu Ile Glu Glu Met Leu Gln Val Leu
            740             745             750

Ile Tyr Ile Val Gly Glu Arg Tyr Val Pro Gly Val Gly Asn Val Thr
        755             760             765

Lys Glu Glu Val Thr Met Arg Glu Ile Ile His Leu Leu Cys Ile Glu
    770             775             780

Pro Met Pro His Ser Ala Ile Ala Lys Asn Leu Pro Glu Asn Glu Asn
785             790             795             800

Asn Glu Thr Gly Leu Glu Asn Val Ile Asn Lys Val Ala Thr Phe Lys
            805             810             815

Lys Pro Gly Val Ser Gly His Gly Val Tyr Glu Leu Lys Asp Glu Ser
            820             825             830

Leu Lys Asp Phe Asn Met Tyr Phe Tyr His Tyr Ser Lys Thr Gln His
            835             840             845

Ser Lys Ala Glu His Met Gln Lys Lys Arg Arg Lys Gln Glu Asn Lys
    850             855             860
```

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Asp Glu Ala Leu Pro Pro Pro Pro Pro Pro Glu Phe Cys Pro Ala Phe
865   870   875   880

Ser Lys Val Ile Asn Leu Leu Asn Cys Asp Ile Met Met Tyr Ile Leu
                885   890   895

Arg Thr Val Phe Glu Arg Ala Ile Asp Thr Asp Ser Asn Leu Trp Thr
            900   905   910

Glu Gly Met Leu Gln Met Ala Phe His Ile Leu Ala Leu Gly Leu Leu
            915   920   925

Glu Glu Lys Gln Gln Leu Gln Lys Ala Pro Glu Glu Glu Val Thr Phe
    930   935   940

Asp Phe Tyr His Lys Ala Ser Arg Leu Gly Ser Ser Ala Met Asn Ile
945   950   955   960

Gln Met Leu Leu Glu Lys Leu Lys Gly Ile Pro Gln Leu Glu Gly Gln
            965   970   975

Lys Asp Met Ile Thr Trp Ile Leu Gln Met Phe Asp Thr Val Lys Arg
            980   985   990

Leu Arg Glu Lys Ser Cys Leu Ile Val Ala Thr Thr Ser Gly Ser Glu
    995   1000   1005

Ser Ile Lys Asn Asp Glu Ile Thr His Asp Lys Glu Lys Ala Glu
    1010   1015   1020

Arg Lys Arg Lys Ala Glu Ala Ala Arg Leu His Arg Gln Lys Ile
    1025   1030   1035

Met Ala Gln Met Ser Ala Leu Gln Lys Asn Phe Ile Glu Thr His
    1040   1045   1050

Lys Leu Met Tyr Asp Asn Thr Ser Glu Met Pro Gly Lys Glu Asp
    1055   1060   1065

Ser Ile Met Glu Glu Glu Ser Thr Pro Ala Val Ser Asp Tyr Ser
    1070   1075   1080

Arg Ile Ala Leu Gly Pro Lys Arg Gly Pro Ser Val Thr Glu Lys
    1085   1090   1095

Glu Val Leu Thr Cys Ile Leu Cys Gln Glu Glu Gln Glu Val Lys
    1100   1105   1110

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Ile Glu Asn Asn Ala Met Val Leu Ser Ala Cys Val Gln Lys Ser
    1115   1120   1125

Thr Ala Leu Thr Gln His Arg Gly Lys Pro Ile Glu Leu Ser Gly
    1130   1135   1140

Glu Ala Leu Asp Pro Leu Phe Met Asp Pro Asp Leu Ala Tyr Gly
    1145   1150   1155

Thr Tyr Thr Gly Ser Cys Gly His Val Met His Ala Val Cys Trp
    1160   1165   1170

Gln Lys Tyr Phe Glu Ala Val Gln Leu Ser Ser Gln Gln Arg Ile
    1175   1180   1185

His Val Asp Leu Phe Asp Leu Glu Ser Gly Glu Tyr Leu Cys Pro
     1190   1195   1200

Leu Cys Lys Ser Leu Cys Asn Thr Val Ile Pro Ile Ile Pro Leu
    1205   1210   1215

Gln Pro Gln Lys Ile Asn Ser Glu Asn Ala Asp Ala Leu Ala Gln
    1220   1225   1230

Leu Leu Thr Leu Ala Arg Trp Ile Gln Thr Val Leu Ala Arg Ile
    1235   1240   1245

Ser Gly Tyr Asn Ile Arg His Ala Lys Gly Glu Asn Pro Ile Pro
    1250   1255   1260

Ile Phe Phe Asn Gln Gly Met Gly Asp Ser Thr Leu Glu Phe His
    1265   1270   1275

Ser Ile Leu Ser Phe Gly Val Glu Ser Ser Ile Lys Tyr Ser Asn
    1280   1285   1290

Ser Ile Lys Glu Met Val Ile Leu Phe Ala Thr Thr Ile Tyr Arg
    1295   1300   1305

Ile Gly Leu Lys Val Pro Pro Asp Glu Arg Asp Pro Arg Val Pro
    1310   1315   1320

Met Leu Thr Trp Ser Thr Cys Ala Phe Thr Ile Gln Ala Ile Glu
    1325   1330   1335

Asn Leu Leu Gly Asp Glu Gly Lys Pro Leu Phe Gly Ala Leu Gln
    1340   1345   1350

```
Asn Arg  Gln His Asn Gly Leu  Lys Ala Leu Met Gln  Phe Ala Val
    1355             1360             1365

Ala Gln  Arg Ile Thr Cys Pro  Gln Val Leu Ile Gln  Lys His Leu
    1370             1375             1380

Val Arg  Leu Leu Ser Val Val  Leu Pro Asn Ile Lys  Ser Glu Asp
    1385             1390             1395

Thr Pro  Cys Leu Leu Ser Ile  Asp Leu Phe His Val  Leu Val Gly
    1400             1405             1410

Ala Val  Leu Ala Phe Pro Ser  Leu Tyr Trp Asp Asp  Pro Val Asp
    1415             1420             1425

Leu Gln  Pro Ser Ser Val Ser  Ser Ser Tyr Asn His  Leu Tyr Leu
    1430             1435             1440

Phe His  Leu Ile Thr Met Ala  His Met Leu Gln Ile  Leu Leu Thr
    1445             1450             1455

Val Asp  Thr Gly Leu Pro Leu  Ala Gln Val Gln Glu  Asp Ser Glu
    1460             1465             1470

Glu Ala  His Ser Ala Ser Ser  Phe Phe Ala Glu Ile  Ser Gln Tyr
    1475             1480             1485

Thr Ser  Gly Ser Ile Gly Cys  Asp Ile Pro Gly Trp  Tyr Leu Trp
    1490             1495             1500

Val Ser  Leu Lys Asn Gly Ile  Thr Pro Tyr Leu Arg  Cys Ala Ala
    1505             1510             1515

Leu Phe  Phe His Tyr Leu Leu  Gly Val Thr Pro Pro  Glu Glu Leu
    1520             1525             1530

His Thr  Asn Ser Ala Glu Gly  Glu Tyr Ser Ala Leu  Cys Ser Tyr
    1535             1540             1545

Leu Ser  Leu Pro Thr Asn Leu  Phe Leu Leu Phe Gln  Glu Tyr Trp
    1550             1555             1560

Asp Thr  Val Arg Pro Leu Leu  Gln Arg Arg Cys Ala  Asp Pro Ala
    1565             1570             1575

Leu Leu  Asn Cys Leu Lys Gln  Lys Asn Thr Val Val  Arg Tyr Pro
    1580             1585             1590
```

```
Arg Lys  Arg Asn Ser Leu Ile  Glu Leu Pro Asp Asp  Tyr Ser Cys
    1595                 1600             1605

Leu Leu  Asn Gln Ala Ser His  Phe Arg Cys Pro Arg  Ser Ala Asp
    1610                 1615             1620

Asp Glu  Arg Lys His Pro Val  Leu Cys Leu Phe Cys  Gly Ala Ile
    1625                 1630             1635

Leu Cys  Ser Gln Asn Ile Cys  Cys Gln Glu Ile Val  Asn Gly Glu
    1640                 1645.                1650

Glu Val  Gly Ala Cys Ile Phe  His Ala Leu His Cys  Lys Ala Arg
    1655                 1660             1665

Gly Cys  Ala Tyr Pro Ala Pro  Tyr Leu Asp Glu Tyr  Gly Glu Thr
    1670                 1675             1680

Asp Pro  Gly Leu Lys Arg Gly  Asn Pro Leu His Leu  Ser Arg Glu
    1685                 1690             1695

Arg Tyr  Arg Lys Leu His Leu  Val Trp Gln Gln His  Cys Ile Ile
    1700                 1705            ·1710

Glu Glu  Ile Ala Arg Ser Gln  Glu Thr Asn Gln Met  Leu Phe Gly
    1715                 1720             1725

Phe Asn  Trp Gln Leu Leu
    1730


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<220>
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